ORDER NO. HAD8605517C8

Service Manual

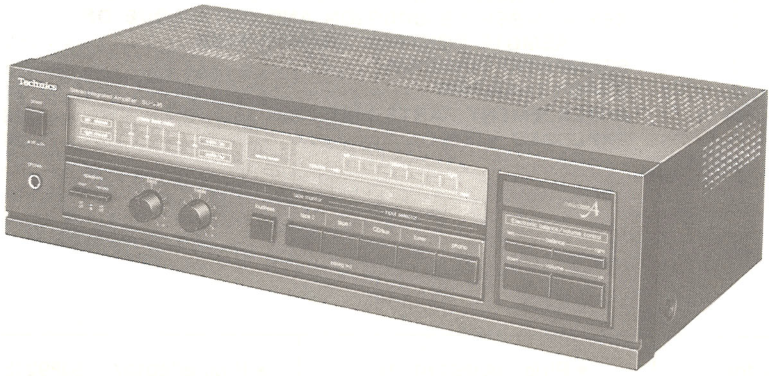
Stereo Integrated Amplifier

Amplifier

SU-Z990

Color

(K) . . . Black Type



Color	Area
(K)	[E] ..... Continental Europe
(K)	[EH] .... Holland
(K)	[EB] .... Belgium
(K)	[EF] .... France
(K)	[EK] .... United Kingdom
(K)	[EG] .... F.R. Germany
(K)	[Ei] ..... Italy
(K)	[XL] .... Australia
(K)	[XA] .... Asia, Latin America, Middle Near East, Africa & Oceania

SPECIFICATIONS

(DIN 45 500)

■ AMPLIFIER SECTION

40 Hz~20 kHz continuous power output	
both channels driven	2 × 85W (8Ω)
1 kHz continuous power output	
both channels driven	2 × 100W (8Ω)
Total harmonic distortion	
rated power at 40 Hz~20 kHz	0.09% (8Ω)
rated power at 1 kHz	0.05% (8Ω)
half power at 1 kHz	0.03% (8Ω)
Intermodulation distortion	
rated power at 60 Hz: 7 kHz=4:1, SMPTE, 8Ω	0.09%
Power bandwidth	
both channels driven, −3 dB	10 Hz~20 kHz (8Ω, 0.09%)
Damping factor	40 (8Ω)
Input sensitivity and impedance	
PHONO	2.5 mV/47kΩ
TUNER, CD/AUX	150 mV/47kΩ
TAPE 1, 2/EXT	150 mV/47kΩ
PHONO maximum input voltage (1 kHz, RMS)	140 mV
S/N	
rated power (8Ω)	
PHONO	70 dB (IHF, A: 70 dB)
TUNER, CD/AUX, TAPE 1, 2/EXT	70 dB (IHF, A: 90 dB)
Frequency response	
PHONO	RIAA standard curve ±0.8 dB (30 Hz~15 kHz)
TUNER, CD/AUX, TAPE 1, 2/EXT	10 Hz~60 kHz (−3 dB)
Tone controls	
BASS	50 Hz, +10 dB~−10 dB
TREBLE	20 kHz, +10 dB~−10 dB
Loudness control (volume at −30 dB)	50 Hz, +9 dB
Muting (using the remote-control transmitter)	−20 dB
Output voltage	
REC OUT	150 mV
Channel balance, CD/AUX 250 Hz~6,300 Hz	±1 dB
Channel separation, CD/AUX 1 kHz	50 dB
Headphones output level and impedance	670 mV/330Ω
Load impedance	
MAIN or REMOTE	8Ω~16Ω
MAIN and REMOTE	8Ω~16Ω

■ GENERAL

Power consumption	470W
Power supply	
For Australia and United Kingdom	AC 50 Hz/60 Hz, 240V
For continental Europe	AC 50 Hz/60 Hz, 220V
For others	AC 50 Hz/60 Hz, 110V/127V/220V/240V
Batteries	DC 3V (2 "AA" size batteries, R6 or equivalent)
Dimensions (W×H×D)	430 × 119 × 240 mm (16-15/16" × 4-11/16" × 9-7/16")
Weight	7.1 kg (15.6 lb.)

Note:
Total harmonic distortion is measured by the digital spectrum analyzer (H.P. 3045 system).

Specifications are subject to change without notice for further improvement.

Technics

Matsushita Electric Trading Co., Ltd.
P.O. Box 288, Central Osaka Japan

NOTES :

1. The power of the tuner and tape deck in this system are supplied through the amplifier. When servicing these components, prepare an each model or an external power supply (servicing power JIG Part No. : SZZA1058C).
(For how to use the JIG, refer to the Service Manual of tuner.)
2. Prepare a transmitter and an amplifier when checking each model of system for its performance using the remote control.

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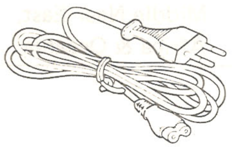
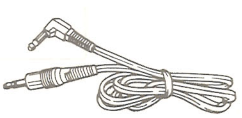
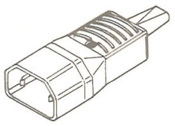
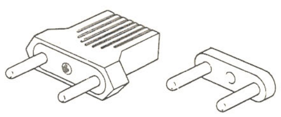
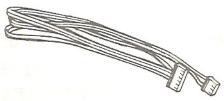
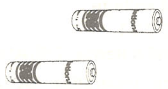
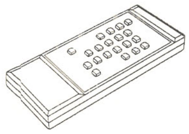
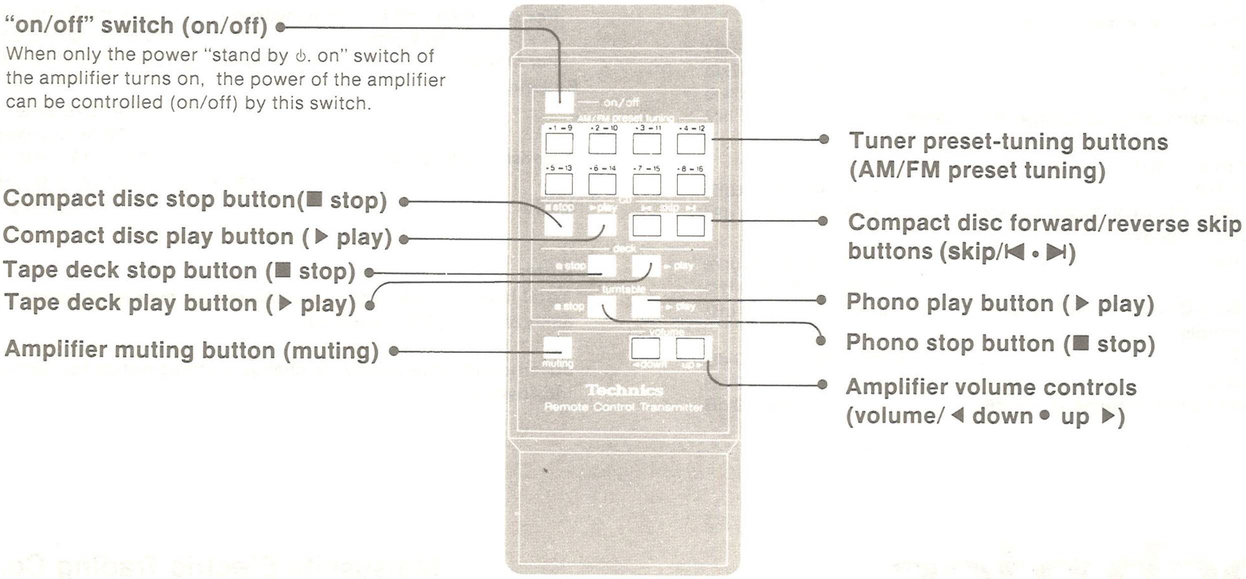
ACCESSORIES

• AC power supply cord . . . . 1 	• Connection cable for remote-control . . . . . . 1 	• Plug (SJP5219–1) 	• Plug adaptor (SJP9215) 
• Flat cable for remote-control . . . . 1 	• Batteries . . . . 2 	• Remote-control transmitter . . 1  Transmitter ass'y is not supply for replacement part.	

LOCATION OF CONTROLS



"on/off" switch (on/off)
When only the power "stand by ⏻. on" switch of the amplifier turns on, the power of the amplifier can be controlled (on/off) by this switch.
Compact disc stop button(■ stop)
Compact disc play button (▶ play)
Tape deck stop button (■ stop)
Tape deck play button (▶ play)
Amplifier muting button (muting)
Tuner preset-tuning buttons (AM/FM preset tuning)
Compact disc forward/reverse skip buttons (skip/⏮ • ⏭)
Phono play button (▶ play)
Phono stop button (■ stop)
Amplifier volume controls (volume/◀ down • up ▶)
on/off
AM/FM preset tuning
deck
turntable
volume
muting
Technics
Remote Control Transmitter

Power "stand by ⏻ . on" switch/indicator

This switch turns on and off the secondary circuit power only. The unit is in the "stand-by" condition when this switch is set to the "stand by ⏻" position. Regardless of the switch setting, the primary circuit is always "live" as long as the power cord is connected to an electrical outlet.

When the power is turned on, the program source which was heard when the power was last turned off can be heard.

Peak-power meters

Note:

If speaker systems with an impedance of 8 ohms are connected, the actual value can be read directly. If, however, the impedance is 16 ohms, the actual output value is 1/2 of the indicated value.

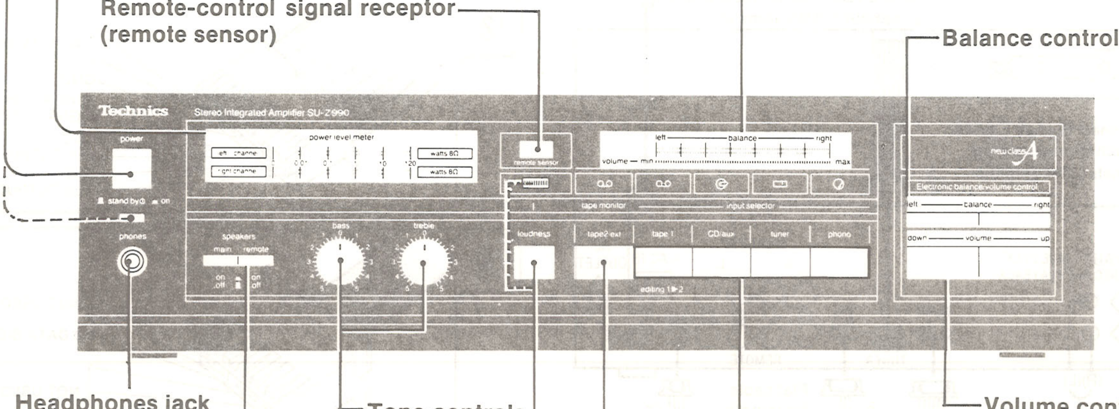
$$\text{Actual output} = \frac{\text{indicated value} \times 8\ \Omega}{\text{speaker impedance } (\Omega)}$$

Volume/balance level indicator

This indicator usually shows the volume level; when the balance control is pressed, however, the position of balance level is displayed for five seconds, after which the display returns again to indication of the volume level. When the amplifier muting button on the remote-control transmitter is pressed, the indicator corresponding to the maximum displayed volume level point will flash.

Remote-control signal receptor (remote sensor)

Balance controls


Technics
Stereo Integrated Amplifier SU-Z990
power
stand by⏻
on
phones
power level meter
left channel
right channel
watts 8Ω
remote sensor
left
balance
right
volume
min
max
new class A
tape monitor
input selector
loudness
tape2/ext
tape 1
CD/aux
tuner
phono
editing 1▶2
Electronic balance/volume control
down
up
speakers
main
remote
bass
treble

Headphones jack

Tone controls (bass/treble)

Volume controls

Input selectors

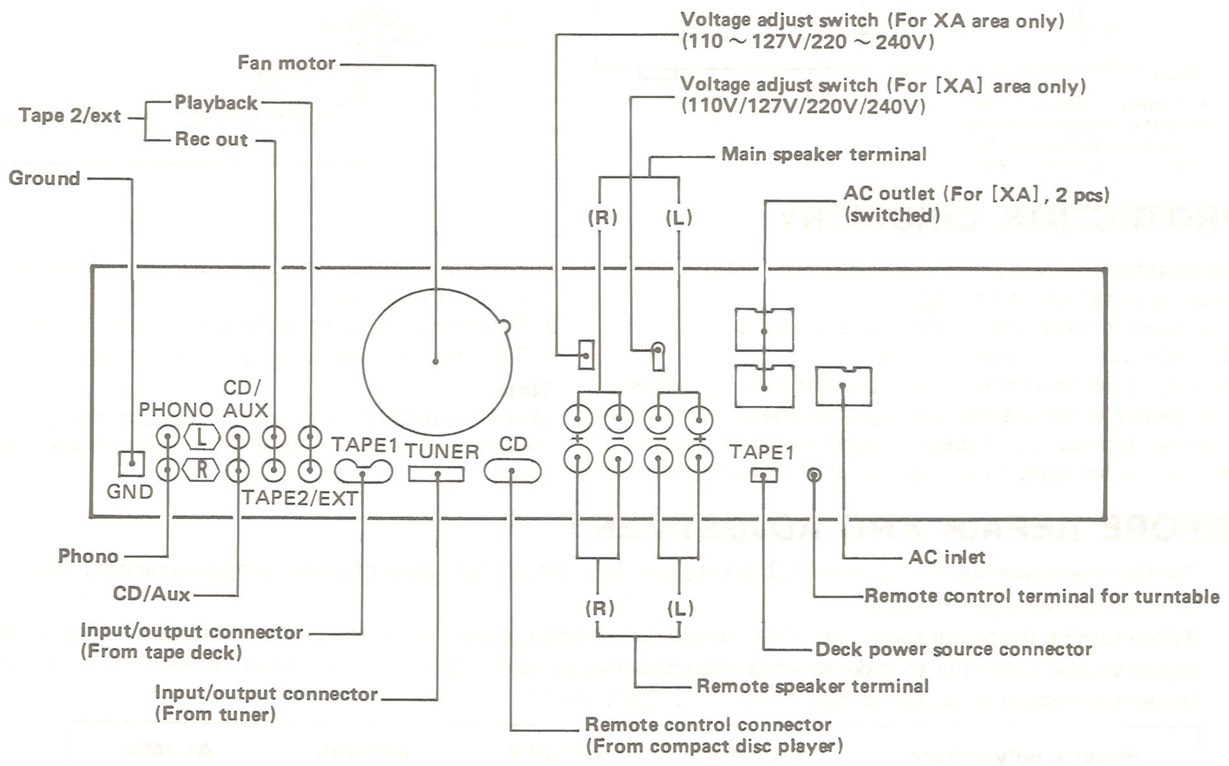
Speaker selectors

Note:

When only one system of speakers is connected, no sound will be heard if both selectors are pressed.

Tape-monitor selector (tape 2/ext)

Loudness switch/indicator

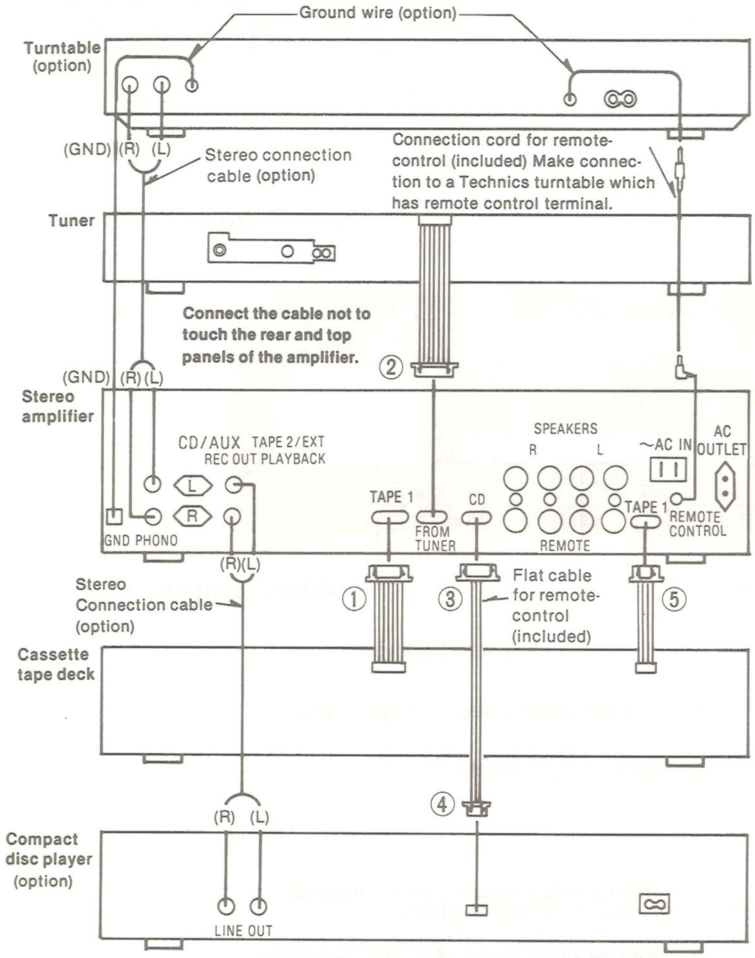

Voltage adjust switch (For XA area only) (110 ~ 127V/220 ~ 240V)
Voltage adjust switch (For [XA] area only) (110V/127V/220V/240V)
Fan motor
Tape 2/ext
Playback
Rec out
Ground
Main speaker terminal
AC outlet (For [XA], 2 pcs) (switched)
(R)
(L)
CD/
PHONO
AUX
L
R
GND
TAPE2/EXT
TAPE1
TUNER
CD
+
−
TAPE1
Phono
CD/Aux
Input/output connector (From tape deck)
Input/output connector (From tuner)
Remote control connector (From compact disc player)
Remote speaker terminal
Deck power source connector
Remote control terminal for turntable
AC inlet

CONNECTIONS

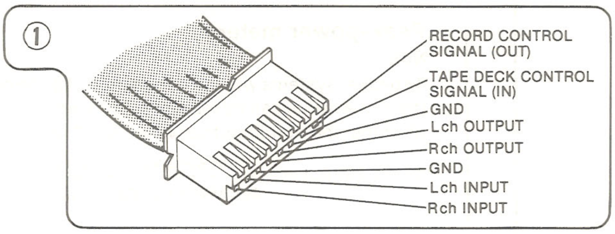
Connect the turntable, tuner, amplifier, cassette deck, and CD player as shown.

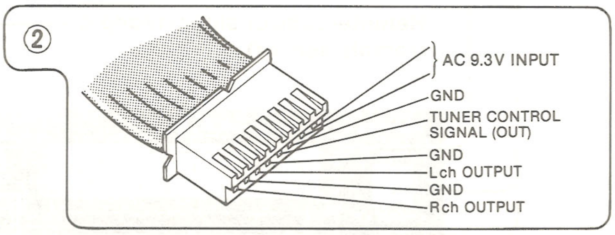
If the connection is wrong, normal operation will not be attalbed.

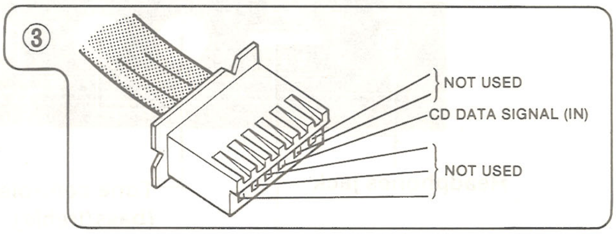
Tuner (ST-Z990/Z990L) and Cassette deck (RS-D225W) is not equipped with power supply. So, the amplifier shown or power supply JIG is necessary for the repair and check of Tuner or Cassette deck.

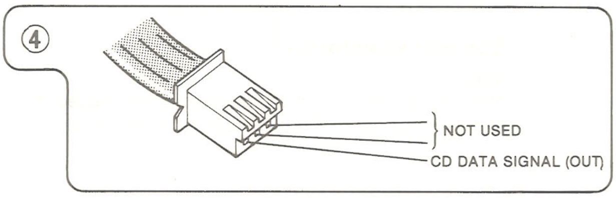

Ground wire (option)
Turntable (option)
(GND) (R) (L)
Stereo connection cable (option)
Connection cord for remote-control (included) Make connection to a Technics turntable which has remote control terminal.
Tuner
Connect the cable not to touch the rear and top panels of the amplifier.
②
(GND) (R) (L)
Stereo amplifier
CD/AUX
TAPE 2/EXT REC OUT PLAYBACK
L
R
GND PHONO
TAPE 1
FROM TUNER
CD
SPEAKERS R L
REMOTE
~AC IN
AC OUTLET
TAPE 1
REMOTE CONTROL
(R) (L)
Stereo Connection cable (option)
①
③
Flat cable for remote-control (included)
⑤
Cassette tape deck
④
(R) (L)
Compact disc player (option)
LINE OUT

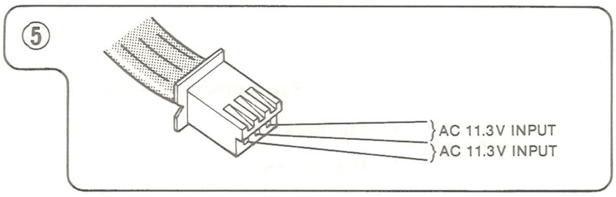
※ Flat cables for remote-control should be connected correctly. If connections are wrong, the units do not function correctly.


①
RECORD CONTROL SIGNAL (OUT)
TAPE DECK CONTROL SIGNAL (IN)
GND
Lch OUTPUT
Rch OUTPUT
GND
Lch INPUT
Rch INPUT


②
AC 9.3V INPUT
GND
TUNER CONTROL SIGNAL (OUT)
GND
Lch OUTPUT
GND
Rch OUTPUT


③
NOT USED
CD DATA SIGNAL (IN)
NOT USED


④
NOT USED
CD DATA SIGNAL (OUT)


⑤
AC 11.3V INPUT
AC 11.3V INPUT

PROTECTION CIRCUITRY

The protection circuitry may have operated if either of the following conditions is noticed:

- No sound is heard when the power is turned on.
- Sound stops during a performance.

The function of this circuitry is to prevent circuitry damage if, for example, the positive and negative speaker connection wires are "shorted", or if speaker systems with an impedance less than the indicated rated impedance of this unit are used.

If this occurs, follow the procedure outlines below:

1. Turn off the power.
2. Determine the cause of the problem and correct it.
3. Turn on the power once again after one minute.

Note

When the protection circuitry functions, the unit will not operate unless the power is first turned off and then on again.

BEFORE REPAIR AND ADJUSTMENT

(1) Turn off the power supply. Using a 10Ω, 5W resistor, shortcircuit both ends of power supply capacitors (C601, C602) in order to discharge the voltage.

(2) Before turning the power supply on, after completion of repair, slowly apply the primary voltage by using a power supply voltage controller to make sure that the consumed current at 50Hz in NO SIGNAL mode should be shown below with respect to supply voltage 110V/127V/220V/240V.

Power supply voltage		AC110V	AC127V	AC220V	AC240V
Consumed current	50Hz	250 ~ 500mA	200 ~ 450mA	150 ~ 400mA	100 ~ 350mA

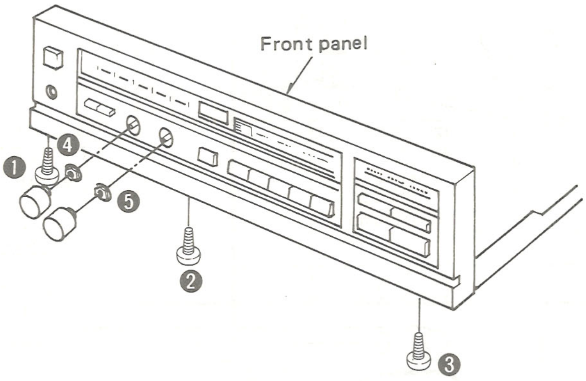
■ DISASSEMBLY INSTRUCTIONS

Ref. No. 1

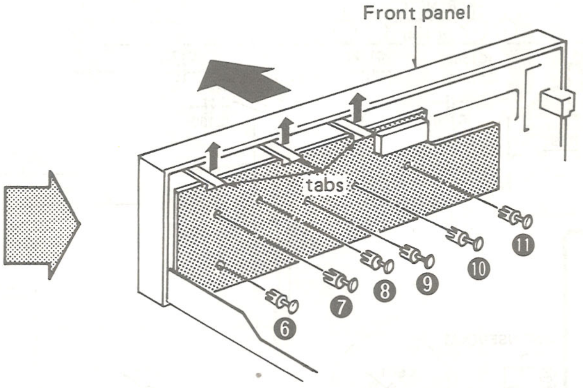
How to remove the front panel

Procedure 1

1. Remove the cabinet.
2. Remove the 3 screws (❶ ~ ❸).
3. Remove the 2 nuts (❹ , ❺).


Front panel
❶
❹
❺
❷
❸

4. Remove the 6 nylone rivet (❻ ~ ⓫).
5. Remove the 3 tabs.
6. Remove the front panel

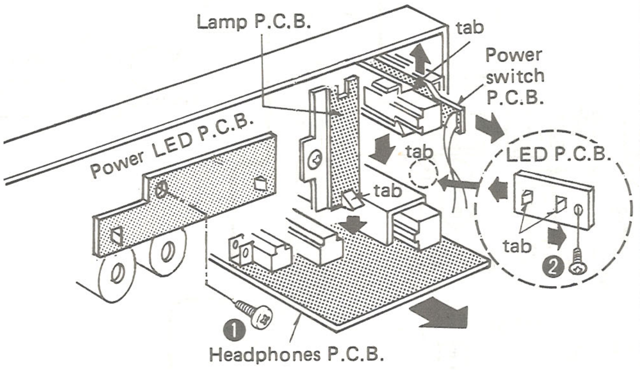

Front panel
tabs
❻
❼
❽
❾
❿
⓫

Ref. No. 2

How to remove the sub P.C.B.

Procedure 1 → 2

1. Remove the 1 screw (❶).
2. Remove the power LED P.C.B.
3. Remove the 1 screw (❷) and 2 tabs.
4. Remove the LED P.C.B.
5. Remove the 3 tabs.
6. Remove the lamp P.C.B., power switch P.C.B. and headphones P.C.B.

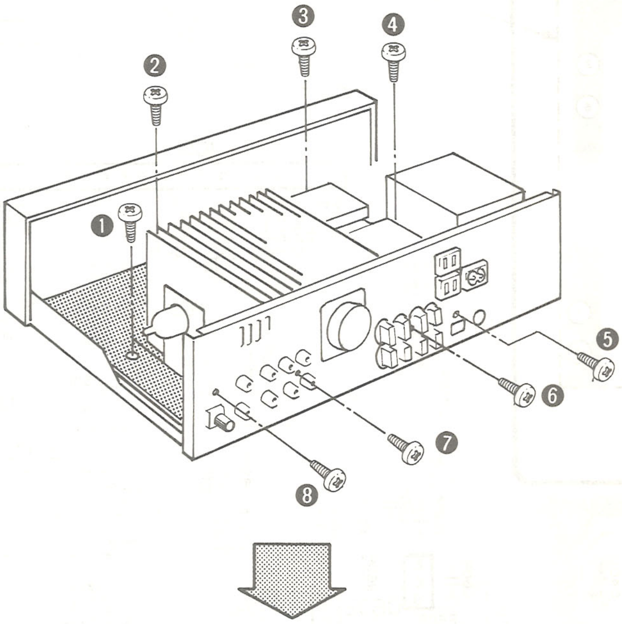

Lamp P.C.B.
tab
Power switch P.C.B.
Power LED P.C.B.
tab
tab
LED P.C.B.
tab
❷
❶
Headphones P.C.B.

Ref. No. 3

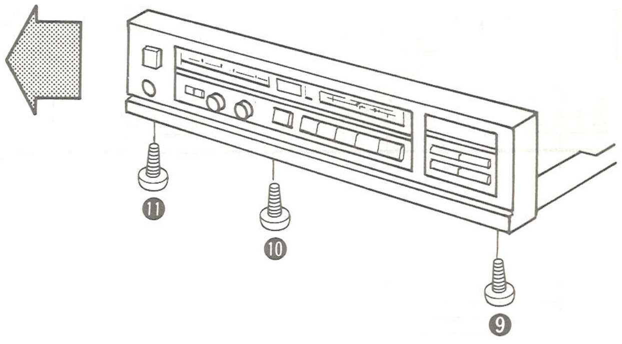
How to remove the main P.C.B.

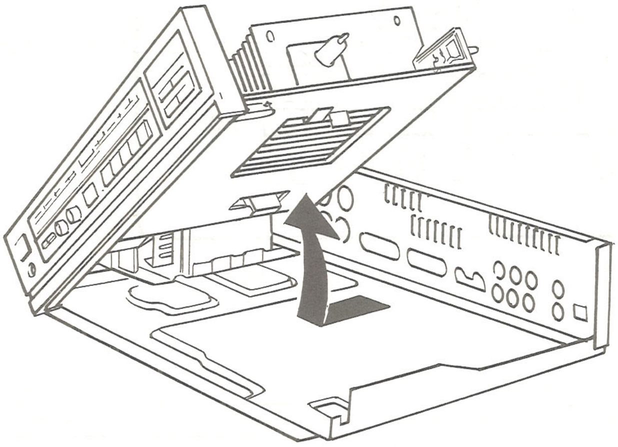
Procedure 3

1. Remove the 8 screws (❶ ~ ❽)

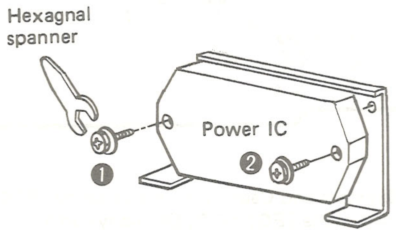


2. Remove the 3 screws (❾ ~ ⓫)



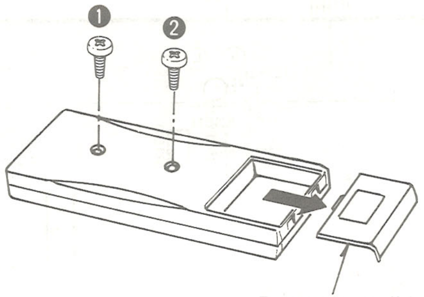


Ref. No. 4	How to remove the Power IC
Procedur	1. Remove the 2 screws (❶ , ❷) by spanner or plier. 2. Unsolder the power IC.



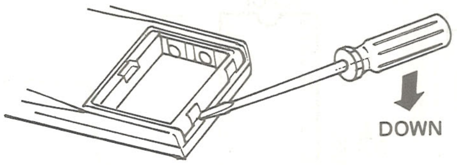
- When mounting the power IC, apply silicon compound (SZZ0L15) to the rear of the power IC.

Ref. No. 5	How to remove the remote control
Procedure 5	1. Remove the Battery cover lid. 2. Remove the 2 screws (❶, ❷)



Battery cover lid

3. Insert a blade screwdriver between the upper and lower covers inside the battery compartment and them slowly loosen the bottom cover.



FUNCTION OF IC TERMINALS

• IC202 (TC9177P) Attenuator

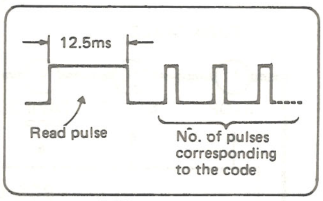
Pin No.	Mark	Description
1	V_{SS}	Power supply (negative).
2, 3 18, 19	CH1-Loudness 1, 2 CH2-Loudness 1, 2	Loudness terminal.
4 17	CH1-OUT 1 CH2-OUT 1	10dB attenuator output. Signal via IN is attenuated by 8 steps, 10dB each, from 0 ~ 70dB.
5 16	CH1-IN 1 CH2-IN 1	10dB attenuator input.
6 15	A-GND	AC grounding terminal.
7 14	CH1-IN 2 CH2-IN 2	2dB attenuator input.
8 13	CH1-OUT 2 CH2-OUT 2	2dB attenuator output. Signal via IN is attenuated by 5 steps, 2dB each, from 0 ~ 8dB.
9	GND	Grounding terminal.
10	CK	Clock input. Used to take in data at DATA pin.
11	DATA	Attenuation/channel select data input. 20-bits input activated by CK signal.
12	ST	Strobe input. Attenuation/channel select data from DATA and CK pins are lapped when this pin is at "H" level. Previous data remain the same while this pin does not reach "H" level.
20	V_{DD}	Power supply (positive).

● IC251 (LC6523C–3068) Microcomputer

<table>
<tr><th>Pin No.</th><th>Mark</th><th>Description</th></tr>
<tr><td>①</td><td>LED 4</td><td rowspan="7">"L" level output is given to each pin according to the volume attenuation in order to light up the volume level LED.

<table>
<tr><th rowspan="2">–dB</th><th>LED</th><th>1</th><th>2</th><th>3</th><th>4</th><th>5</th><th>6</th><th>7</th></tr>
<tr><th>Pin No.</th><th>㉘</th><th>㉙</th><th>㉚</th><th>①</th><th>③</th><th>④</th><th>⑤</th></tr>
<tr><td colspan="2">0~ –4dB</td><td>○</td><td>○</td><td>○</td><td>○</td><td>○</td><td>○</td><td>○</td></tr>
<tr><td colspan="2">–6~–10</td><td>○</td><td>○</td><td>○</td><td>○</td><td>○</td><td>○</td><td></td></tr>
<tr><td colspan="2">–12~–18</td><td>○</td><td>○</td><td>○</td><td>○</td><td>○</td><td></td><td></td></tr>
<tr><td colspan="2">–20~–26</td><td>○</td><td>○</td><td>○</td><td>○</td><td></td><td></td><td></td></tr>
<tr><td colspan="2">–28~–36</td><td>○</td><td>○</td><td>○</td><td></td><td></td><td></td><td></td></tr>
<tr><td colspan="2">–38~–52</td><td>○</td><td>○</td><td></td><td></td><td></td><td></td><td></td></tr>
<tr><td colspan="2">–54~∞</td><td>○</td><td></td><td></td><td></td><td></td><td></td><td></td></tr>
</table>

○ mark
= Light up
= "L" level output</td></tr>
<tr><td>③</td><td>LED 5</td></tr>
<tr><td>④</td><td>LED 6</td></tr>
<tr><td>⑤</td><td>LED 7</td></tr>
<tr><td>㉘</td><td>LED 1</td></tr>
<tr><td>㉙</td><td>LED 2</td></tr>
<tr><td>㉚</td><td>LED 3</td></tr>
<tr><td>⑥</td><td>BACK-UP</td><td>● When this pin is at "L" level, the microcomputer is operated by the back-up circuit. (No. ⑲ pin alone receives an input, all the others not.)
● When this pin is at "H" level, No.⑨pin (POWER ON) gives an "L" level output if No. ⑫ pin (POWER SW) is at "H" level. No.⑨pin (POWER ON) is at "H" level, however, if the remote control's power on/off RAM data are off.</td></tr>
<tr><td>⑦</td><td>REMOTE</td><td>● Data codes reach here from the remote control receiver. (For data codes, refer to the remote control transmitter description.)
● The compact disc player's data codes are outputted from the light receiver direct to the player.</td></tr>
<tr><td>⑧</td><td>AMP</td><td>● When this pin receives an "H" level input, the amplifier turns on to start the operation.
● When this pin receives an "L" level input, the amplifier turns off to stop receiving the matrix key. Power on/off code alone is used to enable the remote control.
● Just when this pin's input comes from "H" to "L" level, the LED1 ~ LED7 and LOUD pins become "H".</td></tr>
<tr><td>⑨</td><td>POWER ON</td><td rowspan="2">● A rising level ("H" level) is detected at No. ⑩ pin to give an "L" level output to No.⑨pin (POWER ON).
● When No. ⑩ pin is at "L" level, No.⑨pin is given an "H" level output (POWER OFF).</td></tr>
<tr><td>⑩</td><td>POWER SW</td></tr>
<tr><td>⑪</td><td>DECK</td><td>● When "Deck Play" code is fed from the remote control to No.⑦pin, the input selector is switched into TAPE 1 by a SELECTOR code output (No. ㉓ ~ No. ㉖ pins), causing an "H" level (when deck connection) output at No. ⑪ pin.
● When "Deck Stop" code is inputted, an "L" level output is given at No. ⑪ pin.</td></tr>
<tr><td>⑫</td><td>ST/DTS</td><td>● When "Tuner" code is fed from the remote control to No.⑦pin, The DTS code is outputted at pin No. ⑫ SELECTOR code is then outputted to make the input selector into TUNER mode.
● If the remote control's CH button has been kept depressed for longer than 1.5 seconds, 15 output pulses (AM code) are fed to the tuner and the number of pulses for a specified channel is given.
● If the button has been released within 1.5 seconds 13 output pulses (FM code) are fed to the tuner and the number of pulses for a specified channel is given.


12.5ms
Read pulse
No. of pulses corresponding to the code

DTS code pulses

<table>
<tr><th>Function</th><th>No. of output pulses</th></tr>
<tr><td>CH 1 (CH 9)</td><td>0</td></tr>
<tr><td>CH 2 (CH 10)</td><td>1</td></tr>
<tr><td>CH 3 (CH 11)</td><td>2</td></tr>
<tr><td>CH 4 (CH 12)</td><td>3</td></tr>
<tr><td>CH 5 (CH 13)</td><td>4</td></tr>
<tr><td>CH 6 (CH 14)</td><td>5</td></tr>
<tr><td>CH 7 (CH 15)</td><td>6</td></tr>
<tr><td>CH 8 (CH 16)</td><td>7</td></tr>
<tr><td>FM</td><td>13</td></tr>
<tr><td>AM</td><td>15</td></tr>
</table></td></tr>
<tr><td>⑬</td><td>DATA/S1</td><td rowspan="2">Together with No. ⑫ pin, Volume UP/DOWN, Balance L/R and Loudness signals are fed to the attenuator IC.</td></tr>
<tr><td>⑭</td><td>CLK</td></tr>
<tr><td>⑮</td><td>OSC 2</td><td rowspan="2">Crystal hook-up terminals for internal clock oscillator.</td></tr>
<tr><td>⑯</td><td>OSC 1</td></tr>
<tr><td>⑲</td><td>RES</td><td>Reset pulse input terminal.
When a reset is made by the back-up circuit using electrolytic capacitors alone, 3 or 4 control RAM data are checked by the program. COLD START is activated when abnormal, HOT START when normal.</td></tr>
<tr><td>⑳</td><td>K2</td><td rowspan="3">Input terminals for matrix keys.</td></tr>
<tr><td>㉑</td><td>K1</td></tr>
<tr><td>㉒</td><td>K0</td></tr>
<tr><td>㉓</td><td>D_A/SO</td><td rowspan="4">Input selector 4-bits BCD codes are outputted with Remote Control codes.
* With Turntable "START" code, the output is given in the order of No. 1 → No. 2 → No. 6 → No. 1.

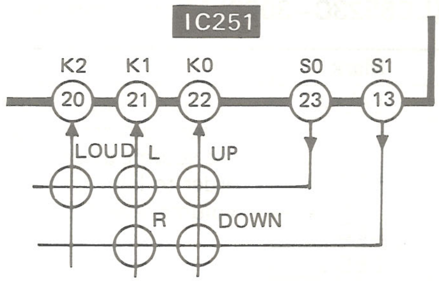
No. 8 and No. 9 code:
Not provided in this unit's with remote control.

<table>
<tr><th></th><th>No.</th><th>Selector</th><th>D_A</th><th>D_B</th><th>D_C</th><th>D_D</th></tr>
<tr><td></td><td>1</td><td>—</td><td>L</td><td>L</td><td>L</td><td>H</td></tr>
<tr><td></td><td>2</td><td>PHONO</td><td>L</td><td>L</td><td>H</td><td>L</td></tr>
<tr><td></td><td>3</td><td>TUNER</td><td>L</td><td>L</td><td>H</td><td>H</td></tr>
<tr><td></td><td>4</td><td>CD/AUX</td><td>L</td><td>H</td><td>L</td><td>L</td></tr>
<tr><td></td><td>5</td><td>TAPE 1</td><td>L</td><td>H</td><td>H</td><td>L</td></tr>
<tr><td></td><td>6</td><td>TURNTABLE START</td><td>H</td><td>L</td><td>L</td><td>L</td></tr>
<tr><td></td><td>7</td><td>TURNTABLE STOP</td><td>H</td><td>L</td><td>L</td><td>H</td></tr>
<tr><td>*</td><td>8</td><td>VCR/TAPE 2/EXT</td><td>L</td><td>H</td><td>H</td><td>H</td></tr>
<tr><td>*</td><td>9</td><td>VHD/AUX 2</td><td>L</td><td>H</td><td>L</td><td>H</td></tr>
</table></td></tr>
<tr><td>㉔</td><td>D_B</td></tr>
<tr><td>㉕</td><td>D_C</td></tr>
<tr><td>㉖</td><td>D_D</td></tr>
<tr><td>㉗</td><td>LOUD</td><td>Loudness on/off signal output terminal.
* By pressing the LOUDNESS key, an "L" level output is given at this pin to turn on the loudness switch. Push the key again, and an "H" level output will come to turn off the loudness switch.</td></tr>
</table>

Notes:

(A) Key matrix, scanning signal input/output pins and their functions ("H" level scan)

IN / OUT	**K0** No.22	**K1** No.21	**K2** No.20
S0 No.23	Volume UP	Balance L	Loudness
S1 No.13	Volume DOWN	Balance R	


IC251
K2
K1
K0
S0
S1
20
21
22
23
13
LOUD
L
UP
R
DOWN

(B) Volume UP/DOWN

1. Push the key once, and the volume will turn up (or down) by 2dB each steps.
2. Keep the key depressed for more than 250msec, and the volume will turn up (or down) all the way automatically.
3. An "L" level output is given at LED1 ~ LED7 pins according to the volume attenuation.

(C) Balance LEFT/RIGHT

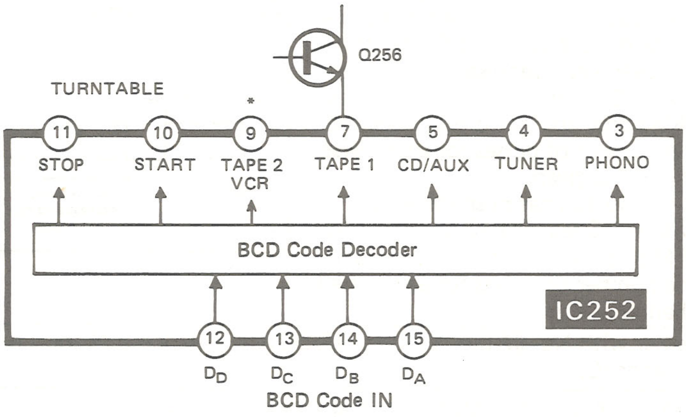
1. Push the key once, and the balance will shift to the left (or right) channel by 2dB. At the same time, the "Volume/Balance" indicator (LED1 ~ LED7) is switched to the Balance position. (The Balance indication goes on for about 4 ~ 6 seconds after the Balance key is released.)
2. Keep the key depressed for more than 500msec, the automatic shift mode will be invited.

• IC252 (DN74LS145) BCD Decoder

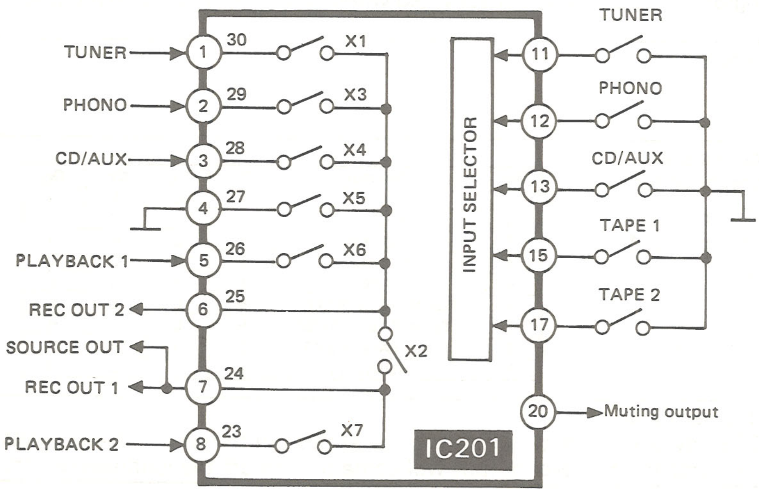
The microcomputer (IC251) codes are fed via its No. ㉓ ~ No. ㉖ pins to the IC252's No. ⑫ ~ No. ⑮ pins. An "L" level output is given according to the selector positions; now the input selector IC (IC201) receives the output as a switching signal. (For the input codes to IC252, refer to the list of codes under No. ㉓ ~ No. ㉖ pins of IC251.)

* Q256 is a transistor to keep Tape Deck 1 from switching from recording mode to playback mode, which might be otherwise caused by possible error data transfer from the remote control. (An "H" level input comes from the tape deck to the amplifier while in recording mode.)

* No.⑨pin is not used in this model.

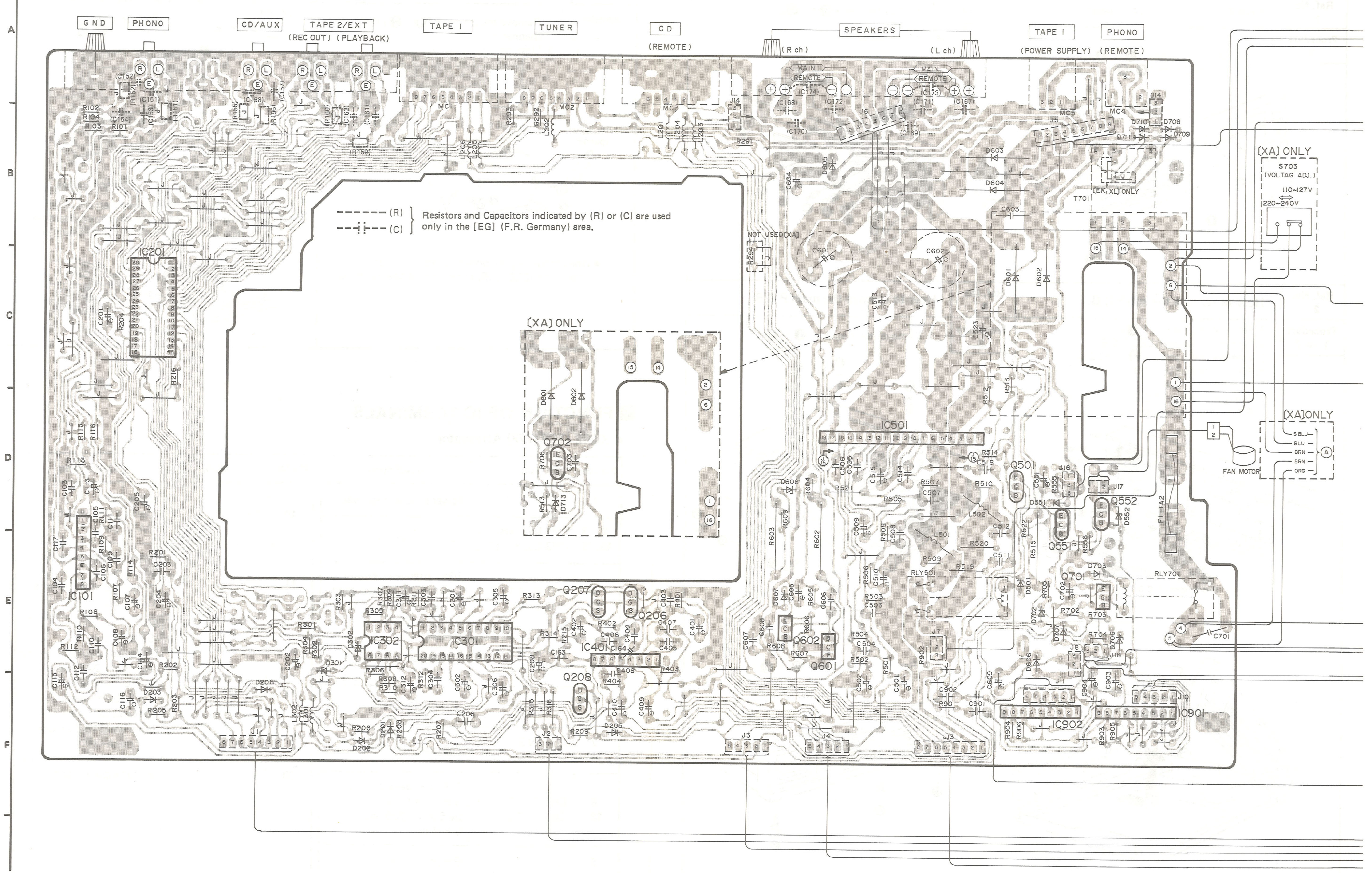

Q256
TURNTABLE
*
11
10
9
7
5
4
3
STOP
START
TAPE 2
VCR
TAPE 1
CD/AUX
TUNER
PHONO
BCD Code Decoder
IC252
12
13
14
15
D_D
D_C
D_B
D_A
BCD Code IN

• IC201 (LC7818) Input Selector

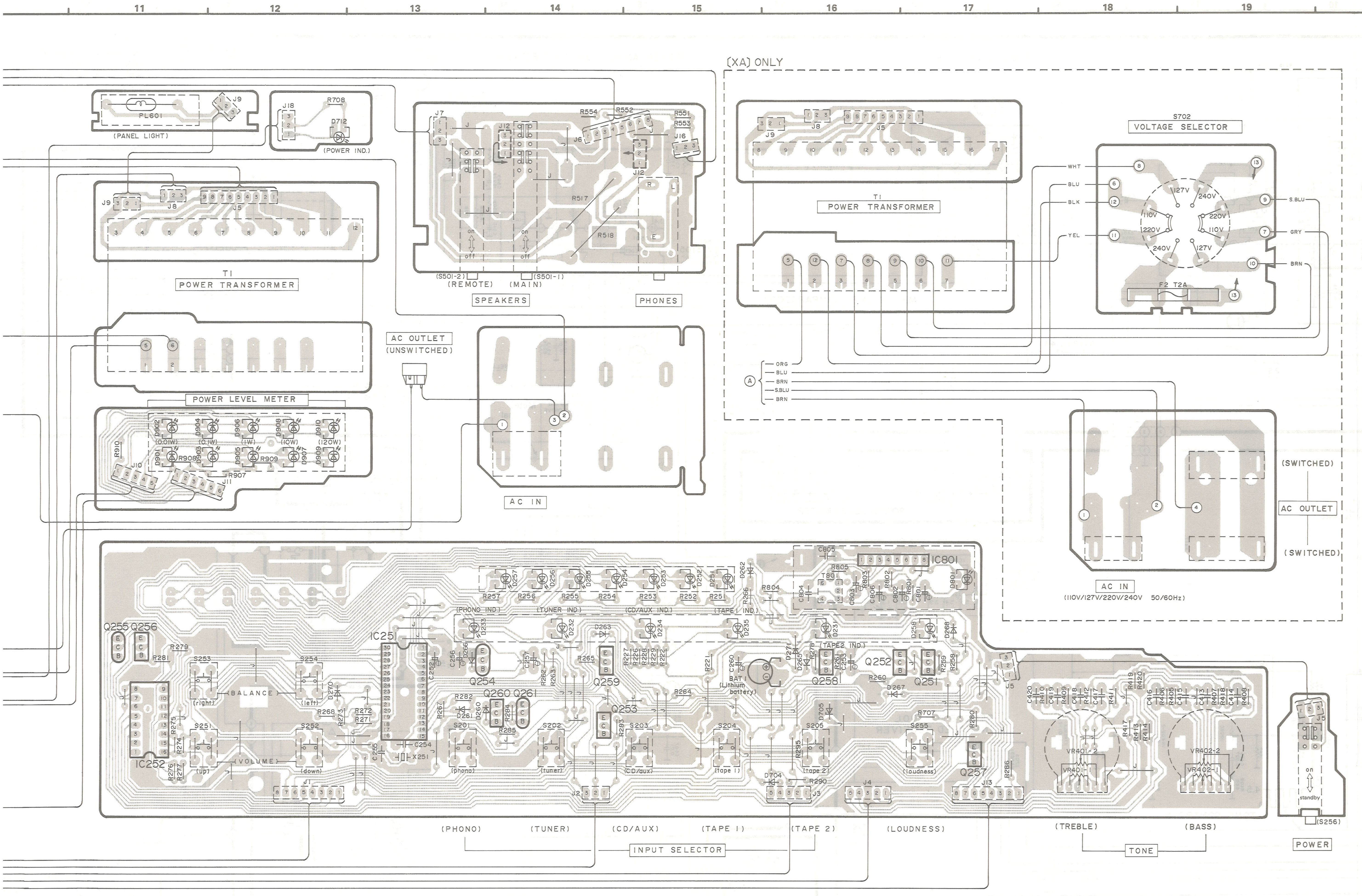

TUNER
PHONO
CD/AUX
PLAYBACK 1
REC OUT 2
SOURCE OUT
REC OUT 1
PLAYBACK 2
1
2
3
4
5
6
7
8
30
29
28
27
26
25
24
23
X1
X3
X4
X5
X6
X2
X7
INPUT SELECTOR
TUNER
PHONO
CD/AUX
TAPE 1
TAPE 2
11
12
13
15
17
20
Muting output
IC201

SW / MODE	X1	X2	X3	X4	X5	X6	X7
PHONO		on	on				
TUNER	on	on					
CD/AUX		on		on			
TAPE 1		on				on	
TAPE 2		on					on

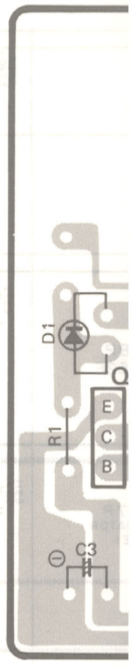
■ CIRCUIT BOARDS AND WIRING CONNECTION DIAGRAM


1
2
3
4
5
6
7
8
9
10
A
B
C
D
E
F
GND
PHONO
CD/AUX
TAPE 2/EXT
(REC OUT) (PLAYBACK)
TAPE I
TUNER
CD
(REMOTE)
SPEAKERS
(R ch)
(L ch)
MAIN
REMOTE
TAPE I
(POWER SUPPLY)
PHONO
(REMOTE)
R
L
E
MC1
MC2
MC3
MC4
MC5
J5
J6
J14
IC201
IC101
IC301
IC302
IC401
IC501
IC901
IC902
Q206
Q207
Q208
Q501
Q551
Q552
Q601
Q602
Q701
Q702
T701
RLY501
RLY701
F1 TA2
S703
(VOLTAG ADJ.)
110~127V
220~240V
[XA] ONLY
[EK, XL] ONLY
NOT USED (XA)
S.BLU
BLU
BRN
BRN
ORG
FAN MOTOR
C601
C602
C701
J1
J2
J3
J4
J7
J8
J10
J11
J13
J16
J17
J18
D601
D602
D603
D604
D605
D708
D709
D710
D711
D713
R706
C703

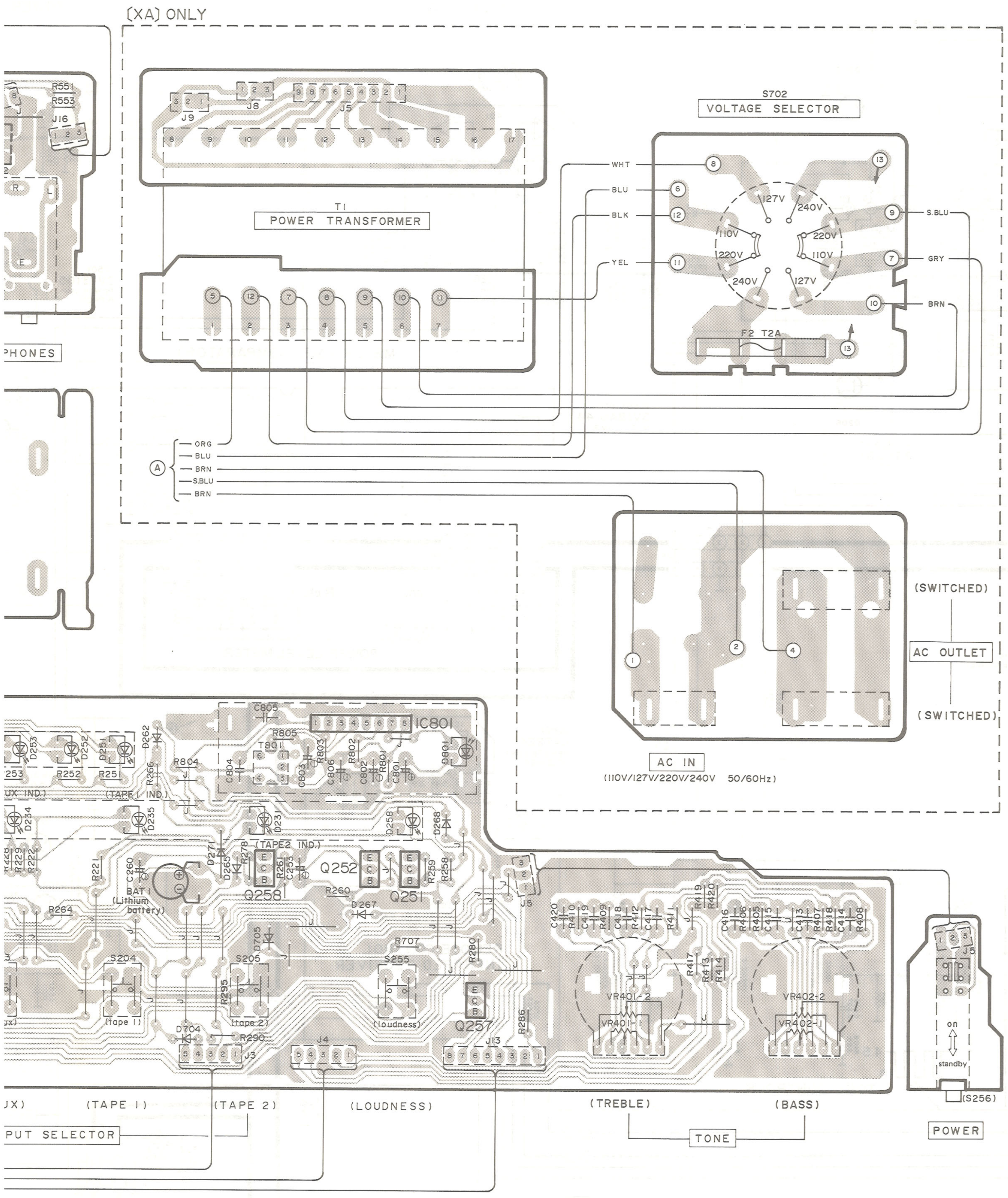
--- (R)
--||-- (C)
Resistors and Capacitors indicated by (R) or (C) are used only in the [EG] (F.R. Germany) area.


11
12
13
14
15
16
17
18
19
20
PL601
J9
(PANEL LIGHT)
J18
R708
D712
(POWER IND.)
J7
R554
R552
R551
R553
J12
J6
J16
R517
R518
(S501-2)
(REMOTE)
(MAIN)
(S501-1)
SPEAKERS
PHONES
J9
J8
J5
T1
POWER TRANSFORMER
AC OUTLET
(UNSWITCHED)
POWER LEVEL METER
D902
D904
D906
D908
D910
(0.01W)
(0.1W)
(1W)
(10W)
(120W)
D901
D903
D905
D907
D909
R910
R908
R909
R907
J10
J11
AC IN
(XA) ONLY
S702
VOLTAGE SELECTOR
WHT
BLU
BLK
YEL
S.BLU
GRY
BRN
127V
240V
110V
220V
F2 T2A
ORG
BLU
BRN
S.BLU
BRN
(SWITCHED)
AC OUTLET
(SWITCHED)
AC IN
(110V/127V/220V/240V 50/60Hz)
IC801
C805
R805
T801
R804
R257
R256
R255
R254
R253
R252
R251
(PHONO IND.)
(TUNER IND.)
(CD/AUX IND.)
(TAPE1 IND.)
(TAPE2 IND.)
Q255
Q256
IC251
IC252
Q254
Q260
Q261
Q259
Q253
Q258
Q252
Q251
Q257
BAT1
(Lithium battery)
(BALANCE)
(right)
(left)
(VOLUME)
(up)
(down)
S251
S252
S253
S254
S201
S202
S203
S204
S205
S255
(phono)
(tuner)
(CD/aux)
(tape 1)
(tape 2)
(loudness)
VR401-1
VR401-2
VR402-1
VR402-2
J1
J2
J3
J4
J13
J5
on
standby
(S256)
(PHONO)
(TUNER)
(CD/AUX)
(TAPE 1)
(TAPE 2)
(LOUDNESS)
INPUT SELECTOR
(TREBLE)
(BASS)
TONE
POWER

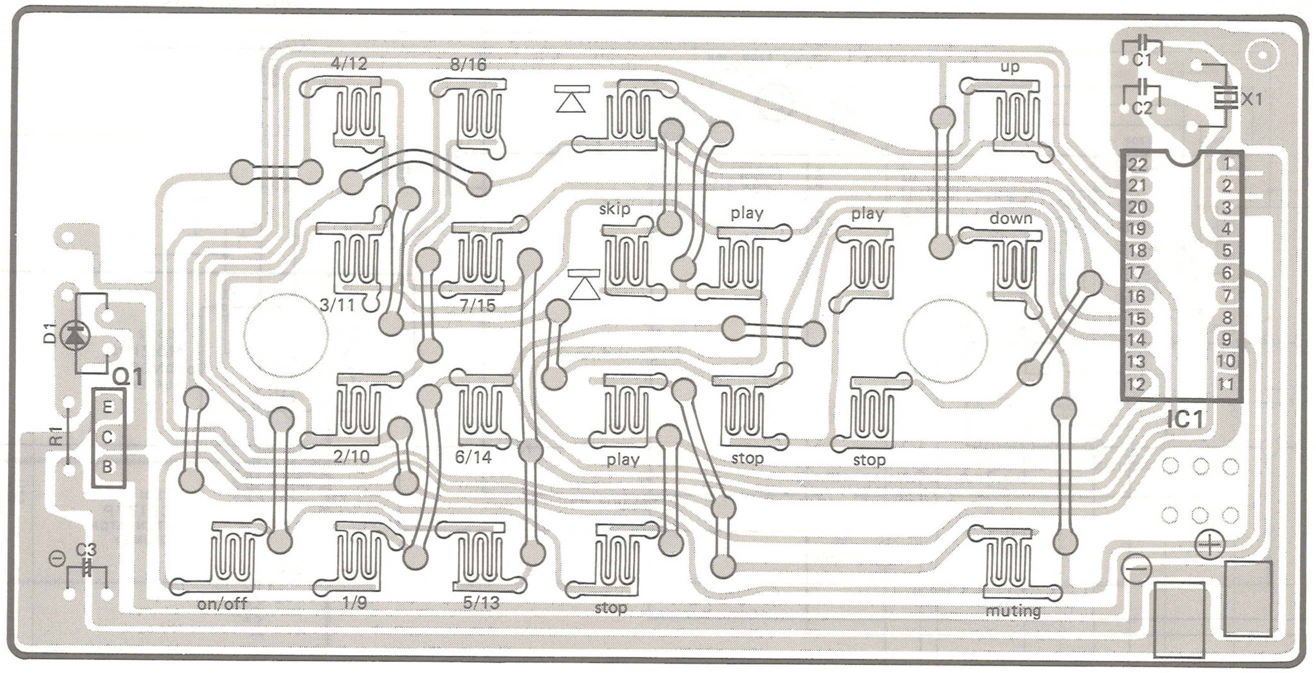
● Remote



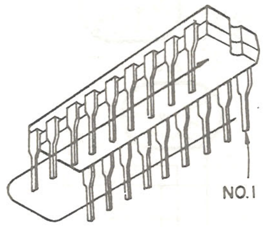
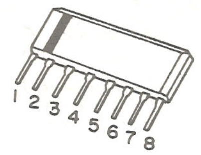
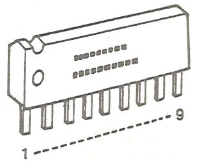
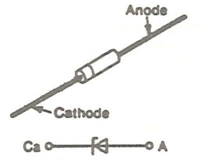
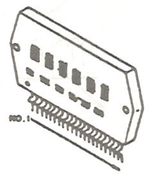
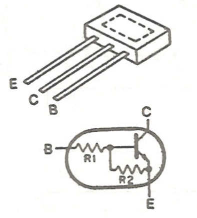
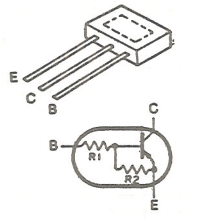
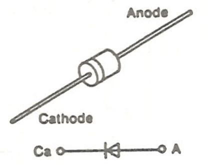
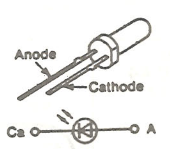
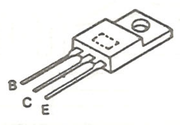
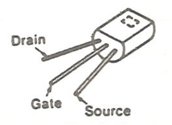
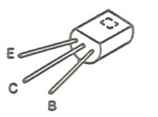
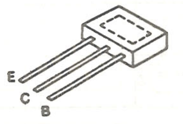
● Termina


(XA) ONLY
R551
R553
J16
J9
J8
J5
S702
VOLTAGE SELECTOR
T1
POWER TRANSFORMER
WHT
BLU
BLK
YEL
S.BLU
GRY
BRN
127V
240V
110V
220V
F2 T2A
PHONES
ORG
BLU
BRN
S.BLU
BRN
A
(SWITCHED)
AC OUTLET
(SWITCHED)
AC IN
(110V/127V/220V/240V 50/60Hz)
C805
R805
IC801
T801
R804
D801
(TAPE1 IND.)
(TAPE2 IND.)
Q252
Q258
Q251
Q257
BAT (Lithium battery)
R264
S204
S205
S255
D704
R290
J3
J4
J13
J5
VR401-2
VR401-1
VR402-2
VR402-1
on
standby
(S256)
(TAPE 1)
(TAPE 2)
(LOUDNESS)
(TREBLE)
(BASS)
TONE
POWER
PUT SELECTOR

• Remote Control Unit (Transmitter)


4/12
8/16
3/11
7/15
skip
play
play
up
down
2/10
6/14
play
stop
stop
on/off
1/9
5/13
stop
muting
C1
C2
X1
D1
Q1
R1
C3
E
C
B
IC1
22 21 20 19 18 17 16 15 14 13 12
1 2 3 4 5 6 7 8 9 10 11

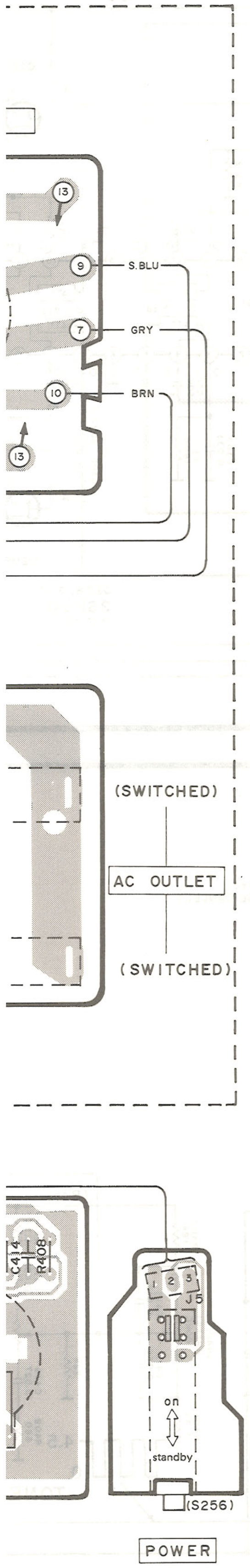
• Terminal guide of transistors, diodes and IC's

<table>
<tr><td colspan="2">NO.1
LC7818 30pin
LC6523C 30pin
MN6013D 22pin
TC9177P 20pin
DN74LS145 16pin
M5218P 8pin</td><td>M5220L 8pin
M5218L 8pin
LA7224 8pin
1 2 3 4 5 6 7 8</td><td>SVIBA6144 9pin
1 .... 9</td><td>MA4051, MA4056
MA4082, MA4140
Anode
Cathode
Ca A</td></tr>
<tr><td>SVI3105
NO.1</td><td>DTC144
DTC124
E C B
R1 R2</td><td>DTA114
E C B
R1 R2</td><td>MA165, MA167
SVDS3V20
1SR35200
Anode
Cathode
Ca A</td><td>LN061330P, LN108327P
LN074328P, PN323B
SE303AY
Anode
Cathode
Ca A</td></tr>
<tr><td>2SD1265
B C E</td><td>2SK301
Drain
Gate
Source</td><td>2SA992
E C B</td><td>2SA1309
2SC3311
UN1231
E C B</td><td></td></tr>
</table>

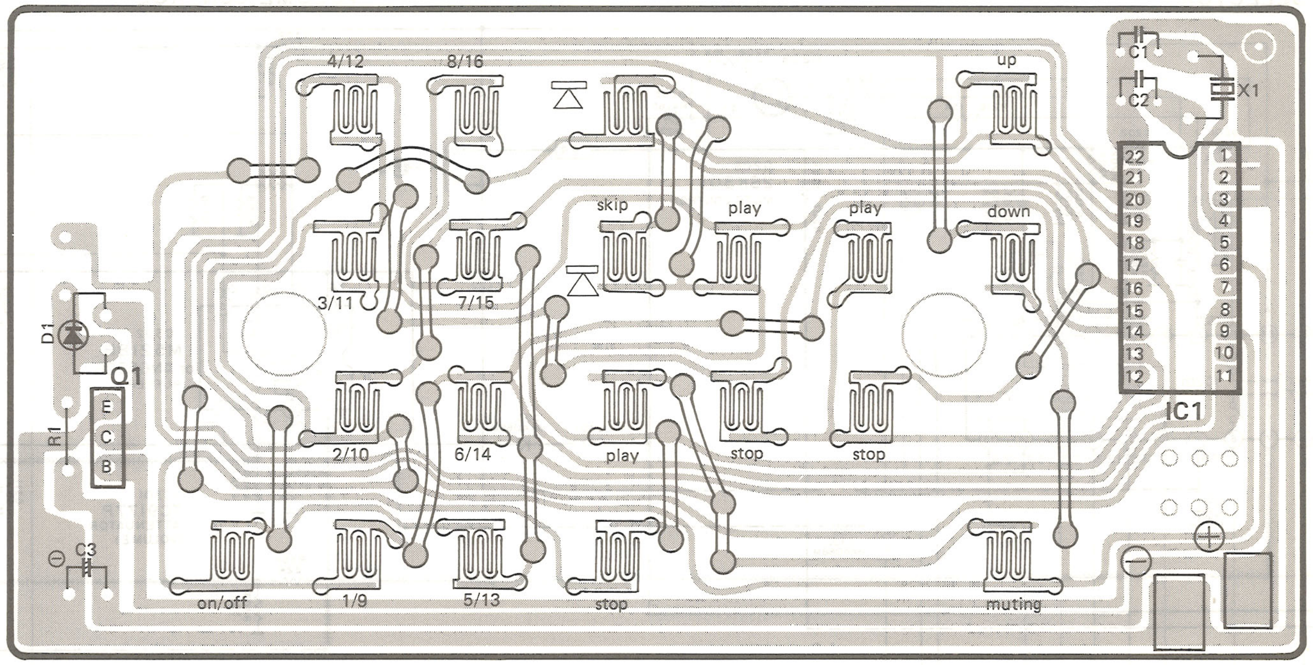
■ S

■ KE
CO

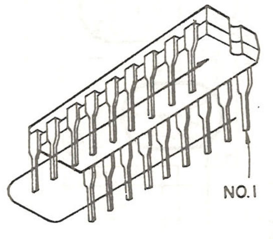
Key No.
0
1
2
3
4
5
6
7
11
12


S.BLU
GRY
BRN
(SWITCHED)
AC OUTLET
(SWITCHED)
C414
R408
on
standby
(S256)
POWER

- **Remote Control Unit (Transmitter)**

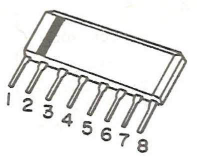

4/12
8/16
up
C1
C2
X1
skip
play
play
down
3/11
7/15
D1
Q1
E
C
B
R1
2/10
6/14
play
stop
stop
IC1
C3
on/off
1/9
5/13
stop
muting

- **Terminal guide of transistors, diodes and IC's**

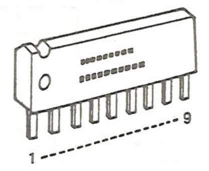


LC7818	30pin
LC6523C	30pin
MN6013D	22pin
TC9177P	20pin
DN74LS145	16pin
M5218P	8pin

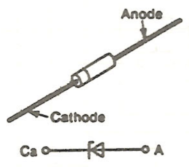
M5220L	8pin
M5218L	8pin
LA7224	8pin



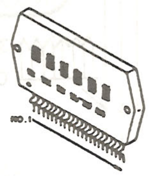
SVIBA6144	9pin



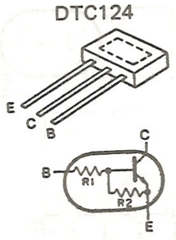
MA4051, MA4056
MA4082, MA4140


Anode
Cathode
Ca
A

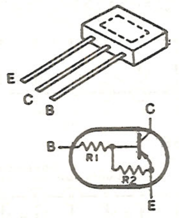
SVI3105



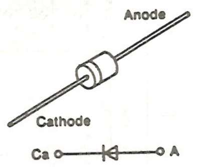
DTC144
DTC124


E
C
B
C
B
R1
R2
E

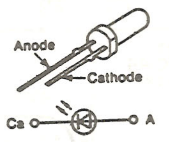
DTA114


E
C
B
C
B
R1
R2
E

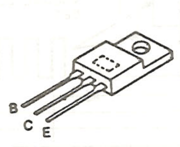
MA165, MA167
SVDS3V20
1SR35200


Anode
Cathode
Ca
A

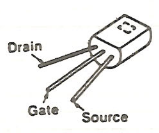
LN061330P, LN108327P
LN074328P, PN323B
SE303AY


Anode
Cathode
Ca
A

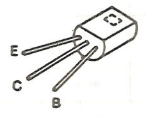
2SD1265



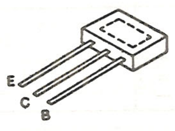
2SK301


Drain
Gate
Source

2SA992

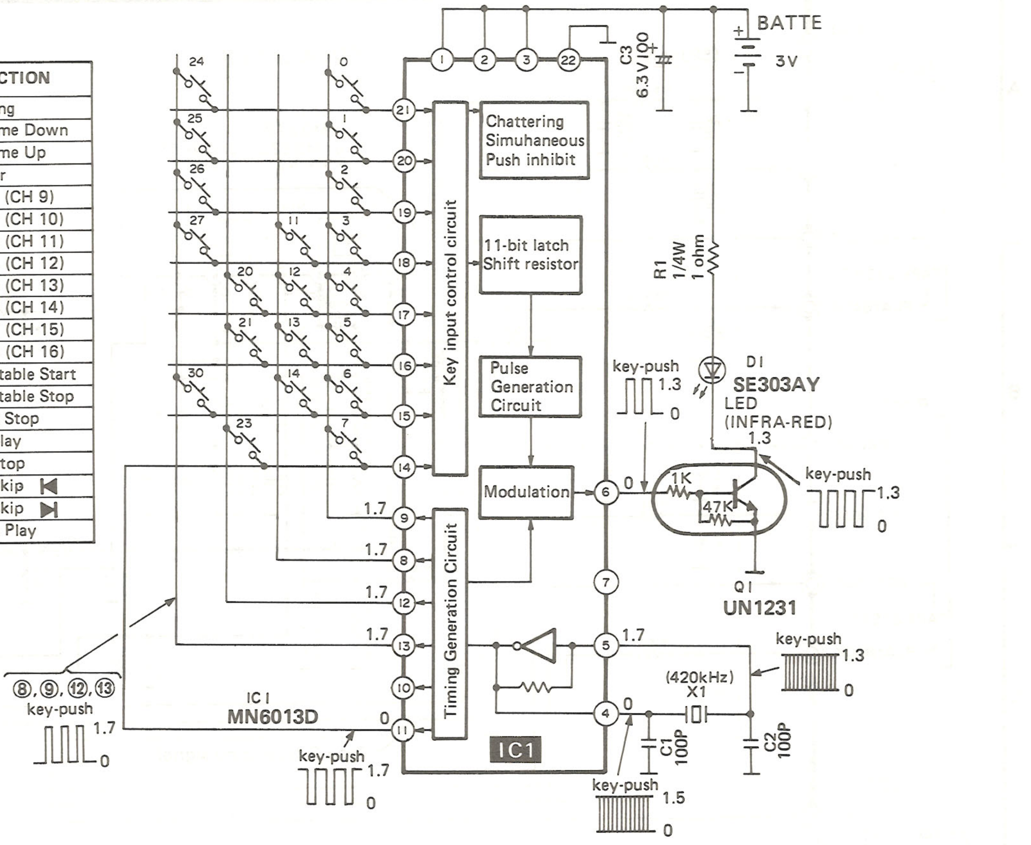


2SA1309
2SC3311
UN1231

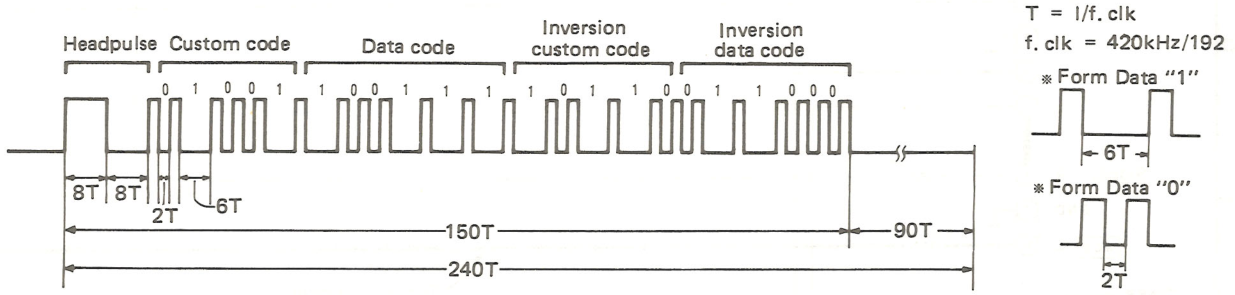


SCHEMTIC DIAGRAM OF REMOTE CONTROL TRANSMITTER

Key No.	FUNCTION
0	Muting
1	Volume Down
2	Volume Up
3	Power
4	CH 1 (CH 9)
5	CH 2 (CH 10)
6	CH 3 (CH 11)
7	CH 4 (CH 12)
11	CH 5 (CH 13)
12	CH 6 (CH 14)
13	CH 7 (CH 15)
14	CH 8 (CH 16)
20	Turntable Start
21	Turntable Stop
23	Deck Stop
24	CD play
25	CD Stop
26	CD Skip ⏮
27	CD Skip ⏭
30	Deck Play

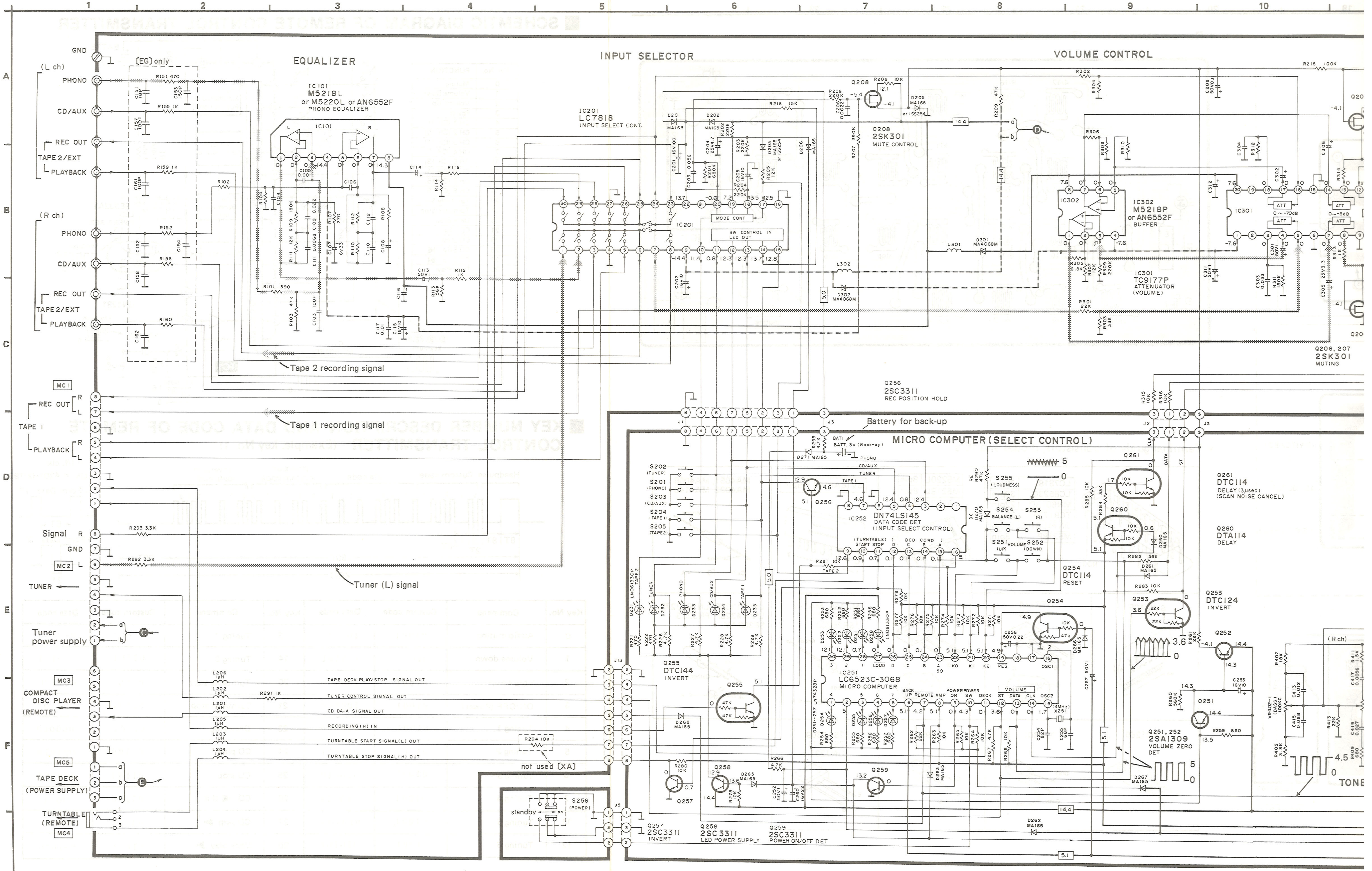

BATTE
3V
C3
6.3V100
Chattering
Simuhaneous
Push inhibit
11-bit latch
Shift resistor
Pulse
Generation
Circuit
Modulation
Key input control circuit
Timing Generation Circuit
R1
1/4W
1 ohm
D1
SE303AY
LED
(INFRA-RED)
1.3
key-push
1K
47K
Q1
UN1231
key-push
1.3
0
(420kHz)
X1
C1
100P
C2
100P
key-push
1.5
0
IC1
MN6013D
IC1
⑧,⑨,⑫,⑬
key-push
1.7
0
1.7
0

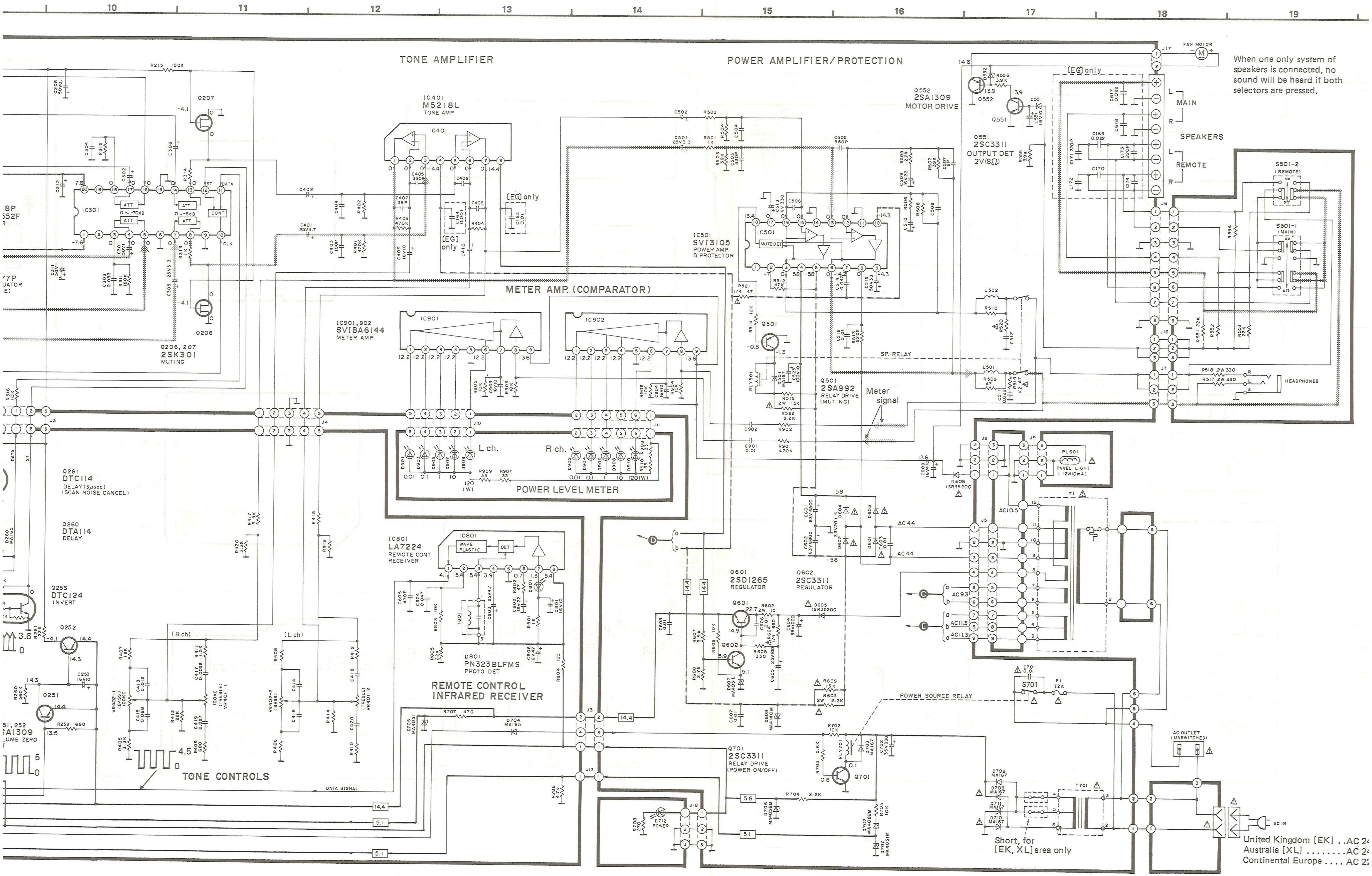
KEY NUMBER DESCRIPTION AND DATA CODE OF REMOTE CONTROL TRANSMITTER (Example. key No. 1)


Headpulse
Custom code
Data code
Inversion
custom code
Inversion
data code
0 1 0 0 1
1 0 0 1 1 1
1 0 1 1 0
0 1 1 0 0 0
8T
8T
2T
6T
150T
90T
240T
※ Form Data "1"
6T
※ Form Data "0"
2T

T = l/f. clk
f. clk = 420kHz/192

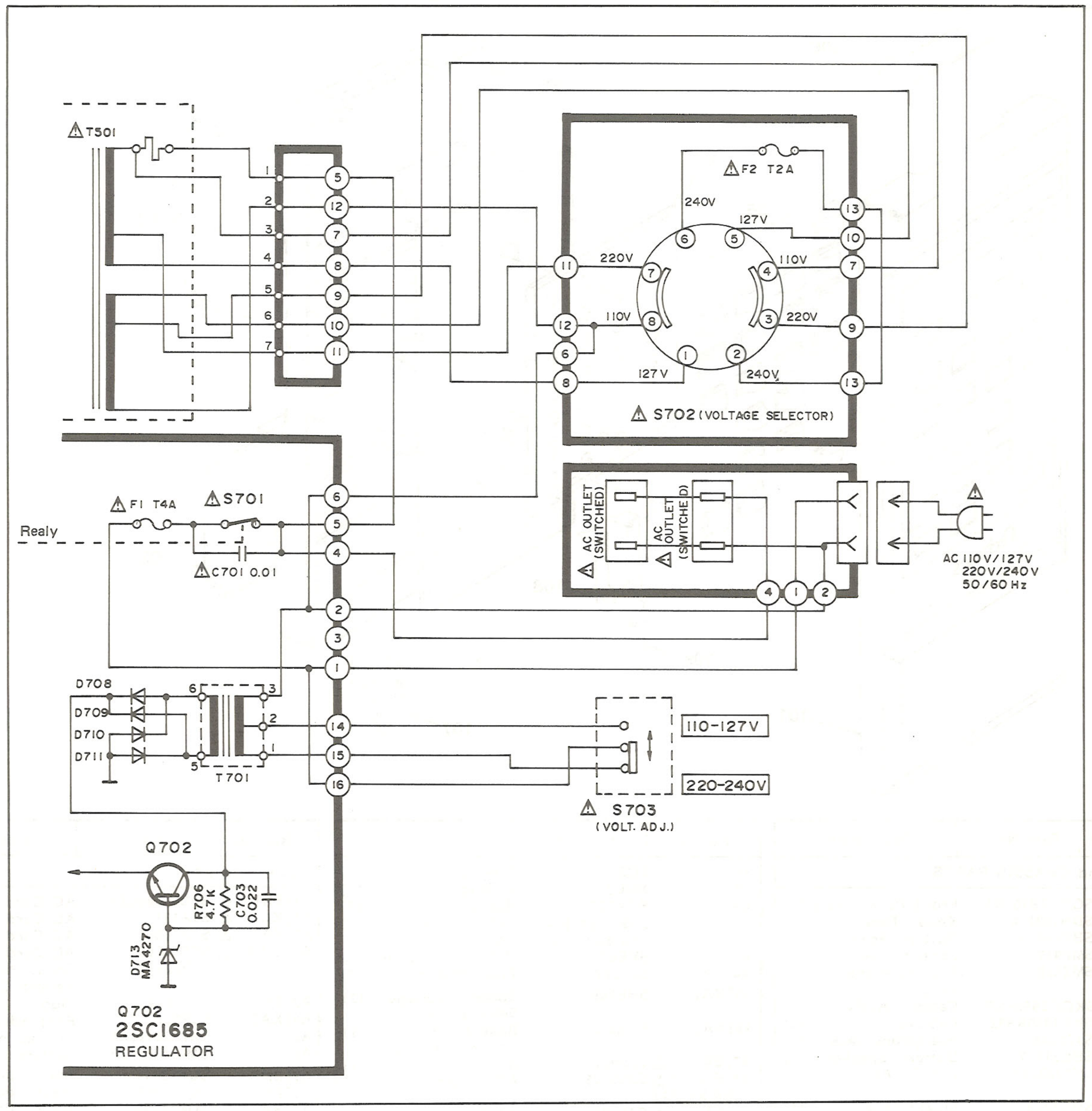
Key No.	Command	Custom code	Data code	Key No.	Command	Custom code	Data code
0	Audio muting	01001	100111	13	Tuning 7	01001	010110
1	Volume down	01001	100101	14	Tuning 8	01001	010111
2	Volume up	01001	100100	20	Turntable start	01001	001100
3	ON/OFF (Power)	01001	100000	21	Turntable stop	01001	001101
4	Tuning 1	01001	010000	23	Deck stop	01001	000000
5	Tuning 2	01001	010001	24	CD play	01100	001010
6	Tuning 3	01001	010010	25	CD stop	01100	000000
7	Tuning 4	01001	010011	26	CD ⏮ skip	01100	000010
11	Tuning 5	01001	010100	27	CD skip ⏭	01100	000011
12	Tuning 6	01001	010101	30	Deck play ▶	01001	001010


EQUALIZER
INPUT SELECTOR
VOLUME CONTROL
MICRO COMPUTER (SELECT CONTROL)
GND
(L ch)
PHONO
CD/AUX
REC OUT
TAPE 2/EXT
PLAYBACK
(R ch)
[EG] only
IC101
M5218L
or M5220L or AN6552F
PHONO EQUALIZER
IC201
LC7818
INPUT SELECT CONT.
MODE CONT
SW CONTROL IN
LED OUT
Q208
2SK301
MUTE CONTROL
IC302
M5218P
or AN6552F
BUFFER
IC301
TC9177P
ATTENUATOR
(VOLUME)
ATT
0 ~ -70dB
0 ~ -8dB
Q206, 207
2SK301
MUTING
Tape 2 recording signal
Tape 1 recording signal
Tuner (L) signal
Battery for back-up
MC1
REC OUT
TAPE 1
PLAYBACK
Signal
MC2
TUNER
Tuner power supply
MC3
COMPACT DISC PLAYER (REMOTE)
MC5
TAPE DECK (POWER SUPPLY)
TURNTABLE (REMOTE)
MC4
J1
J2
J3
J5
J13
Q256
2SC3311
REC POSITION HOLD
S202 (TUNER)
S201 (PHONO)
S203 (CD/AUX)
S204 (TAPE 1)
S205 (TAPE2)
IC252
DN74LS145
DATA CODE DET
(INPUT SELECT CONTROL)
(TURNTABLE) START STOP
BCD CORD
S255 (LOUDNESS)
S254 BALANCE (L)
S253 (R)
S251 (UP)
VOLUME
S252 (DOWN)
Q254
DTC114
RESET
Q261
DTC114
DELAY (3μsec)
(SCAN NOISE CANCEL)
Q260
DTA114
DELAY
Q253
DTC124
INVERT
Q252
Q251
Q251, 252
2SA1309
VOLUME ZERO DET
Q255
DTC144
INVERT
IC251
LC6523C-3068
MICRO COMPUTER
BACK UP
REMOTE
POWER AMP
POWER ON
POWER SW
DECK ST
VOLUME DATA CLK
OSC2
X251 (4MHz)
TAPE DECK PLAY/STOP SIGNAL OUT
TUNER CONTROL SIGNAL OUT
CD DATA SIGNAL OUT
RECORDING (H) IN
TURNTABLE START SIGNAL (L) OUT
TURNTABLE STOP SIGNAL (H) OUT
not used (XA)
S256 (POWER)
standby
on
Q257
2SC3311
INVERT
Q258
2SC3311
LED POWER SUPPLY
Q259
2SC3311
POWER ON/OFF DET
D231 LN06133OP
TUNER
PHONO
CD/AUX
TAPE 1
TAPE 2
(R ch)
VR402-1 (BASS) 100KB
TONE
BATT. 3V (Back-up)
14.4
5.1


10
11
12
13
14
15
16
17
18
19
TONE AMPLIFIER
POWER AMPLIFIER/PROTECTION
IC401
M5218L
TONE AMP
IC301
Q206, 207
2SK301
MUTING
[EG] only
Q552
2SA1309
MOTOR DRIVE
Q551
2SC3311
OUTPUT DET
2V(8Ω)
FAN MOTOR
J17
MAIN
SPEAKERS
REMOTE
S501-2
(REMOTE)
S501-1
(MAIN)
HEADPHONES
IC501
SV13105
POWER AMP
& PROTECTOR
MUTE DET
METER AMP. (COMPARATOR)
IC901, 902
SVIBA6144
METER AMP
IC901
IC902
Q501
2SA992
RELAY DRIVE
(MUTING)
SP. RELAY
Meter
signal
L ch.
R ch.
POWER LEVEL METER
Q261
DTC114
DELAY (3μsec)
(SCAN NOISE CANCEL)
Q260
DTA114
DELAY
Q253
DTC124
INVERT
IC801
LA7224
REMOTE CONT.
RECEIVER
D801
PN323BLFMS
PHOTO DET
REMOTE CONTROL
INFRARED RECEIVER
(R ch)
(L ch)
TONE CONTROLS
DATA SIGNAL
Q601
2SD1265
REGULATOR
Q602
2SC3311
REGULATOR
Q701
2SC3311
RELAY DRIVE
(POWER ON/OFF)
POWER SOURCE RELAY
PL601
PANEL LIGHT
(12V110mA)
T1
S701
F1
T2A
T701
AC OUTLET
(UNSWITCHED)
AC IN
D712
POWER
Short, for
[EK, XL] area only
United Kingdom [EK] . . AC 24
Australia [XL] . . . . AC 24
Continental Europe . . . . AC 22

When one only system of speakers is connected, no sound will be heard if both selectors are pressed.

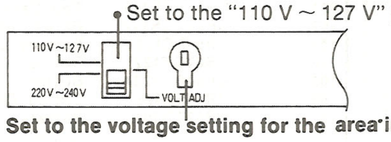
• Power source circuit for other areas [XA]


⚠T501
1
2
3
4
5
6
7
5
12
7
8
9
10
11
⚠F2 T2A
240V
127V
220V
110V
110V
220V
127V
240V
11
12
6
8
13
10
7
9
13
6
5
4
3
2
1
7
8
⚠S702 (VOLTAGE SELECTOR)
⚠ AC OUTLET (SWITCHED)
⚠ AC OUTLET (SWITCHED)
4
1
2
⚠
AC 110V/127V
220V/240V
50/60 Hz
⚠F1 T4A
⚠S701
Realy
⚠C701 0.01
6
5
4
2
3
1
14
15
16
D708
D709
D710
D711
6
5
3
2
1
T701
110-127V
220-240V
⚠ S703
(VOLT. ADJ.)
Q702
R706
4.7K
C703
0.022
D713
MA4270
Q702
2SC1685
REGULATOR

• Before use

WARNING: To avoid any serious damages, strongly be sure the voltage setting of the both voltage adjust switches according to the area.
Be sure to disconnect the mains cord before adjusting both voltage adjust switches.
Use a minus (–) screwdriver to set the voltage adjust switches.

1. **This amplifier is already set to the "220 V ~ 240 V" position before shipment.**
   If the power supply in your areas is 110 V ~ 127 V,
   Set to the "110 V ~ 127 V" position.


110V~127V
220V~240V
VOLT ADJ

2. **Set to the voltage setting for the area in which the unit will be used.**
   (If the power supply in your area is 117 V or 120 V, set to the "127 V" position.)

Note:
There are no voltage adjust switches for some countries; the correct voltage is already set.

Measure against abnormality of memory function

a) Pull out the AC cord and check that the voltage at VDD terminal (pin No. 2) of IC251 (microcomputer) is +2V or over.
b) If the voltage is less than +2V, check that the battery voltage is +2V or over.
c) If the battery voltage is lower than +2V, replace the battery with new one.
* ● Make sure that the battry voltage is +2V or over before setting the battery.
● Do not short-circuit between the plus and minus sides. Also, set the battery in correct position.

CAUTION

This lithium battery is critical component (Type No. BR2325-1VC, Mfr by Matsushita). Please observe proper polality and exact location when replacement and soldering in the replacement lithium battery.

■ SCHEMATIC DIAGRAM

(This schematic diagram may be modified at any time with the development of new technology.)

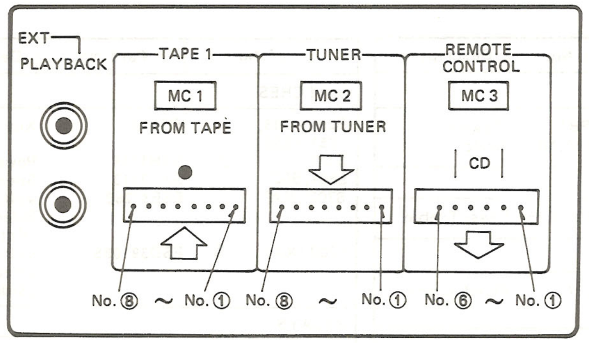
Notes :

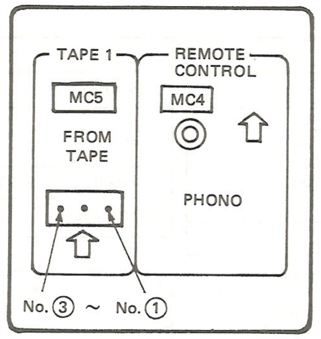
1. **S201** : Input selector, "**phono**" switch
2. **S202** : Input selector, "**Tuner**" switch
3. **S203** : Input selector, "**CD/Aux**" switch
4. **S204** : Input selector, "**Tape 1**" switch
5. **S205** : Input selector, **Tape 2/Ext**" switch
6. **S251** : Volume, "**Up**" switch
7. **S252** : Volume, "**Down**" switch
8. **S253** : Balance, "**Left**" switch
9. **S254** : Balance, "**Right**" switch
10. **S255** : Loudness switch
11. **S256** : Power switch in "**on**" position. (■ standby, ▬ on)
12. **S501** : Main speakers switch in "**on**" position.
13. **S502** : Remote speakers switch in "**on**" position.
14. **S701** : Main power supply switch (with relay) in "**on**" position.
15. **S702 (For [XA] area only)** : Voltage adjust switch in **"220V"** position.
    (127V ↔ 110V ↔ 220V ↔ 240V)
16. **S703 (For [XA] area only)** : Voltage adjust switch in **"220–240V"** position.
    (110 – 127V ↔ 220 – 240V)
17. Indicated voltage values are the standard values for the unit measured by the DC electronic circuit tester (high-impedance) with the chassis taken as standard. Therefore, there may exist some errors in the voltage values, depending on the internal impedance of the DC circuit tester.
    Measurement condition :
    Input Selector → Tuner (no signal)
    Volume Ind. → Level "1" light-up
    Loudness → off
18. ⇨ Signal lines (L channel)   ⇢ phono
19. ━□━ Positive (+B) voltage lines
    ╍□╍ Negative (–B) voltage lines
20. Important safety notice:
    Components identified by ⚠ mark have special characteristics important for safety. When replacing any of these components use only manufacturer's specified parts.

*** Caution !**

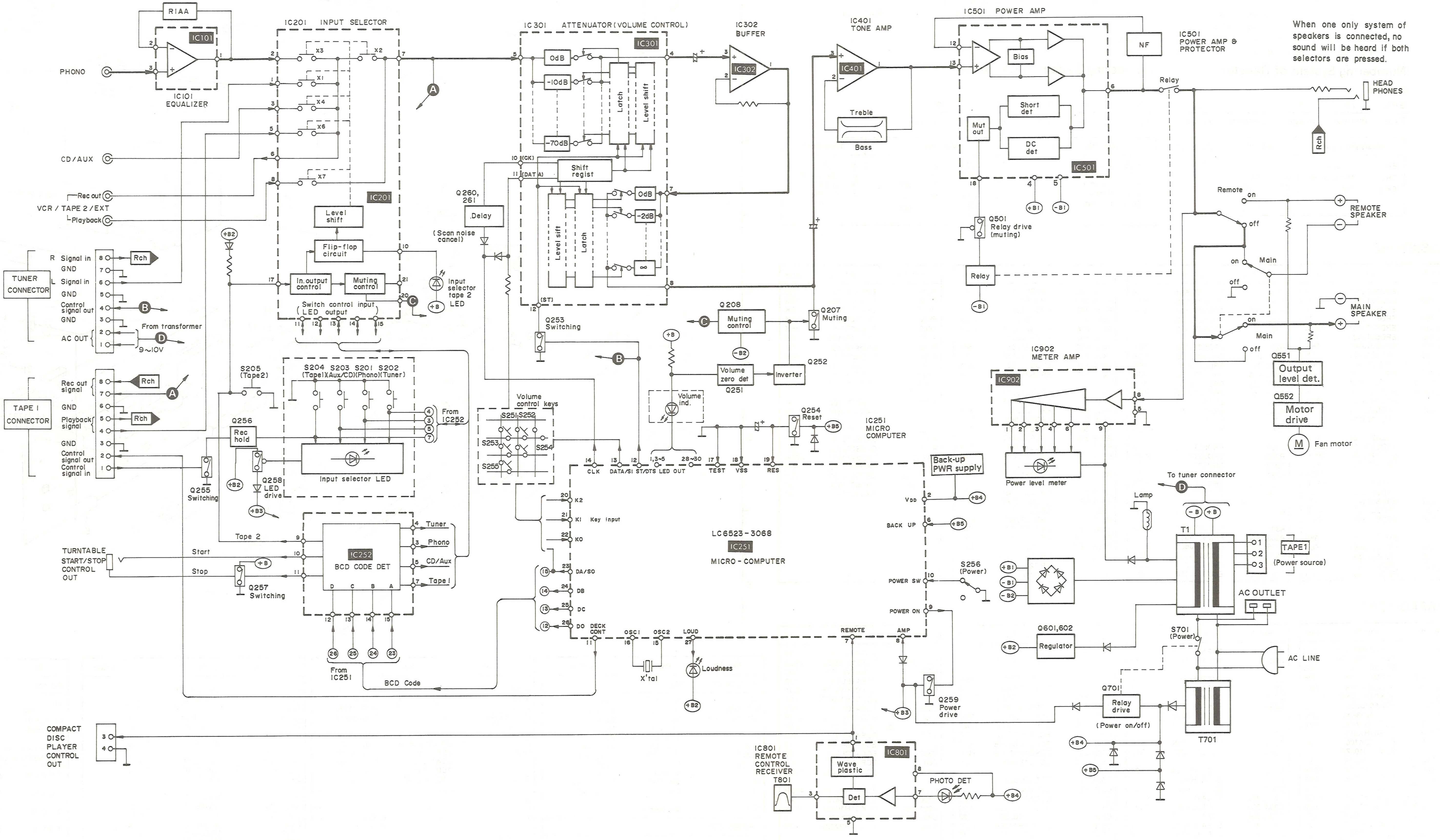
IC and LSI are sensitive to static electricity.
Secondary trouble can be prevented by taking care during repair.
* Cover the parts boxes made of plastics with aluminum foil.
* Ground the soldering iron.
* Put a conductive mat on the work table.
* Do not touch the legs of IC or LSI with the fingers directly.

• DECK/TUNER/CD player Connection Terminal of Rear panel


EXT
PLAYBACK
TAPE 1
MC 1
FROM TAPE
TUNER
MC 2
FROM TUNER
REMOTE CONTROL
MC 3
CD
No.⑧ ~ No.①
No.⑧ ~ No.①
No.⑥ ~ No.①


TAPE 1
MC5
FROM TAPE
REMOTE CONTROL
MC4
PHONO
No.③ ~ No.①

BLOCK DIAGRAM


When one only system of speakers is connected, no sound will be heard if both selectors are pressed.

RIAA
IC101
IC101 EQUALIZER
PHONO
IC201 INPUT SELECTOR
X3
X2
X1
X4
X6
X7
IC201
Level shift
Flip-flop circuit
In.output control
Muting control
Switch control input
(LED output)
Input selector tape 2 LED
CD/AUX
Rec out
VCR / TAPE 2 / EXT
Playback
TUNER CONNECTOR
R Signal in
GND
L Signal in
GND
Control signal out
GND
AC OUT
Rch
From transformer
9~10V
TAPE 1 CONNECTOR
Rec out signal
GND
Playback signal
GND
Control signal out
Control signal in
S205 (Tape2)
S204 S203 S201 S202
(Tape1)(Aux/CD)(Phono)(Tuner)
Q256
Rec hold
Q258 LED drive
Q255 Switching
Input selector LED
From IC252
Tape 2
TURNTABLE START/STOP CONTROL OUT
Start
Stop
Q257 Switching
IC252
BCD CODE DET
Tuner
Phono
CD/Aux
Tape 1
From IC251
BCD Code
COMPACT DISC PLAYER CONTROL OUT
IC301 ATTENUATOR (VOLUME CONTROL)
IC301
0dB
-10dB
-70dB
Latch
Level shift
Shift regist
-2dB
∞
Q260, 261
Delay
(Scan noise cancel)
Q253 Switching
Volume control keys
S251 S252 S253 S254 S255
IC302 BUFFER
IC302
IC401 TONE AMP
IC401
Treble
Bass
Q208
Muting control
Q207 Muting
Volume zero det
Q251
Inverter
Q252
Volume ind.
Q254 Reset
IC251 MICRO COMPUTER
CLK
DATA/SI
ST/DTS
LED OUT
TEST
VSS
RES
K2
K1
Key input
K0
DA/SO
DB
DC
DO
DECK CONT
OSC1
OSC2
LOUD
X'tal
Loudness
LC6523-3068
IC251
MICRO-COMPUTER
Back-up PWR supply
VDD
BACK UP
POWER SW
POWER ON
REMOTE
AMP
S256 (Power)
Q259 Power drive
IC801 REMOTE CONTROL RECEIVER
T801
IC801
Wave plastic
Det
PHOTO DET
IC501 POWER AMP
Bias
Short det
DC det
Mut out
IC501
NF
IC501 POWER AMP & PROTECTOR
Relay
Q501 Relay drive (muting)
Relay
HEAD PHONES
Remote
on
off
Main
REMOTE SPEAKER
MAIN SPEAKER
IC902 METER AMP
IC902
Power level meter
Q551
Output level det.
Q552
Motor drive
M
Fan motor
To tuner connector
Lamp
T1
TAPE1 (Power source)
AC OUTLET
Q601,602
Regulator
S701 (Power)
AC LINE
Q701
Relay drive
(Power on/off)
T701
+B
-B
+B1
-B1
+B2
-B2
+B3
+B4
+B5

REPLACEMENT PARTS LIST

Notes:
1. Part numbers are indicated on most mechanical parts.
   Please use this part number for parts orders.
2. Important safety notice:
   Components identified by ⚠ mark have special characteristics important for safety. When replacing any of these components use only manufacturer's specified parts.
3. Bracketed indications in Ref. No. columns specify the area.
   Parts without these indications can be used for all areas.
4. The parenthesized numbers in the column of description stand for the quantity per set.
5. The unit of resistance is OHM (Ω).
   K = 1000Ω, M = 1000KΩ
6. The unit of capacitance is MICROFARAD (μF).
   P = 10^{-6} μF

Numbering System of Resistor

Example

ERD	25	F	J	101
Type	Wattage	Shape	Tolerance	Value

Resistor Type	Wattage	Tolerance
ERD : Carbon ERG : Metal Oxide ERC : Solid	12 : 1/2W 2A : 2W S2 : 1/4W 25 : 1/4W S1 : 1/2W	J : ±5% K : ±10%

Numbering System of Capacitor

Example

ECKD	1H	102	Z	F
Type	Voltage	Value	Tolerance	Peculiarity

Capacitor Type	Voltage		Tolerance
ECE : Electrolytic ECC : Ceramic ECK : Ceramic ECF : Semi-conductor ECQ : Polyester	0J : 6.3V 1V : 35V 1C : 16V 1E : 25V D : 25V 1H : 50V	66V : 66V 1J : 63V KC : 400V AC 2A : 100V 2H : 500V	K : ±10% Z : +80%, −20% M : ±20% P : +100%, −0%

● RESISTORS

Ref. No.	Part No.	Value
R1	ERDS2TJ1R0	1
R101, 102	ERDS2TJ391	390
R103, 104	ERDS2TJ473	47K
R107, 108	ERDS2TJ271	270
R109, 110	ERDS2TJ184	180K
R111, 112	ERDS2TJ123	12K
R113, 114	ERDS2TJ563	56K
R115, 116	ERDS2TJ102	1K
R151,152[EG]	ERDS2TJ471	470
R155,156[EG]	ERDS2TJ102	1K
R157,158[EG]	ERDS2TJ102	1K
R159,160[EG]	ERDS2TJ102	1K
R201	ERDS2TJ684	680K
R202, 203	ERDS2TJ224	220K
R204	ERDS2TJ224	220K
R205	ERDS2TJ123	12K
R206	ERDS2TJ224	220K
R207	ERDS2TJ394	390K
R208	ERDS2TJ103	10K
R209	ERDS2TJ474	470K
R215	ERDS2TJ684	680K
R216	ERDS2TJ153	15K
R221, 222	ERDS2TJ471	470
R226, 227	ERDS2TJ472	4.7K
R228, 229	ERDS2TJ472	4.7K
R251, 252	ERDS2TJ681	680
R253, 254	ERDS2TJ681	680
R255, 256	ERDS2TJ681	680
R257, 258	ERDS2TJ681	680
R259	ERDS2TJ681	680

Ref. No.	Part No.	Value
R260	ERDS2TJ564	560K
R261	ERDS2TJ223	22K
R262, 263	ERDS2TJ103	10K
R264, 265	ERDS2TJ103	10K
R266, 267	ERDS2TJ472	4.7K
R268	ERDS2TJ103	10K
R271, 272	ERDS2TJ103	10K
R273, 274	ERDS2TJ103	10K
R275, 276	ERDS2TJ103	10K
R277, 278	ERDS2TJ103	10K
R279, 280	ERDS2TJ103	10K
R281	ERDS2TJ103	10K
R282	ERDS2TJ563	56K
R283	ERDS2TJ103	10K
R284	ERDS2TJ333	33K
R285	ERDS2TJ103	10K
R286	ERDS2TJ472	4.7K
R290	ERDS2TJ473	47K
R291	ERDS2TJ102	1K
R292, 293	ERD25TJ332	3.3K
R294 Except[XA]	ERD25TJ103	10K
R295	ERD25TJ472	4.7K
R301, 302	ERDS2TJ223	22K
R303, 304	ERDS2TJ333	33K
R305, 306	ERDS2TJ682	6.8K
R307, 308	ERDS2TJ123	12K
R309, 310	ERDS2TJ224	220K
R311, 312	ERDS2TJ184	180K

Ref. No.	Part No.	Value
R313, 314	ERDS2TJ102	1K
R315, 316	ERD25TJ103	10K
R401, 402	ERDS2TJ474	470K
R403, 404	ERDS2TJ474	470K
R405, 406	ERDS2TJ332	3.3K
R407, 408	ERDS2TJ183	18K
R409, 410	ERDS2TJ681	680
R411, 412	ERDS2TJ152	1.5K
R413, 414	ERDS2TJ223	22K
R417, 418	ERDS2TJ392	3.9K
R419, 420	ERDS2TJ332	3.3K
R501, 502	ERDS2TJ102	1K
R503, 504	ERDS2TJ393	39K
R505, 506	ERDS2TJ822	8.2K
R507, 508	ERDS2TJ124	120K
R509, 510	ERDS2TJ470	47
R512	ERDS2TJ473	47K
R513	ERDS2TJ824	820K
R514	ERD25TJ123	12K
R515	ERG2ANJ152	1.5K
R517, 518	ERG2ANJ331	330
R519, 520	ERDS1FJ4R7	4.7
R521	ERD25FJ470	47
R522	ERDS2TJ822	8.2K
R551, 552	ERDS2TJ223	22K
R553, 554	ERDS2TJ223	22K
R555, 556	ERDS2TJ392	3.9K
R602	ERG2ANJ100	10
R603	ERG2ANJ222	2.2K
R604	ERD25FJ681	680

Ref. No.	Part No.	Value
R605	ERDS2TJ331	330
R606	ERDS2TJ103	10K
R607	ERDS2TJ392	3.9K
R608	ERDS2TJ272	2.7K
R609	ERDS2TJ153	15K
R702	ERDS2TJ103	10K
R704	ERDS1FJ102	1K
R705	ERDS2TJ103	10K
R706 [XA]	ERDS2TJ472	4.7K
R707	ERDS2TJ471	470
R708	ERDS2TJ271	270
R801	ERDS2TJ102	1K
R802	ERDS2TJ470	47
R803	ERDS2TJ103	10K
R804	ERDS2TJ101	100
R805	ERDS2TJ223	22K
R901, 902	ERDS2TJ474	470K
R903, 904	ERDS2TJ103	10K
R905, 906	ERDS2TJ103	10K
R907, 908	ERDS2TJ330	33
R909, 910	ERDS2TJ330	33

● CAPACITORS

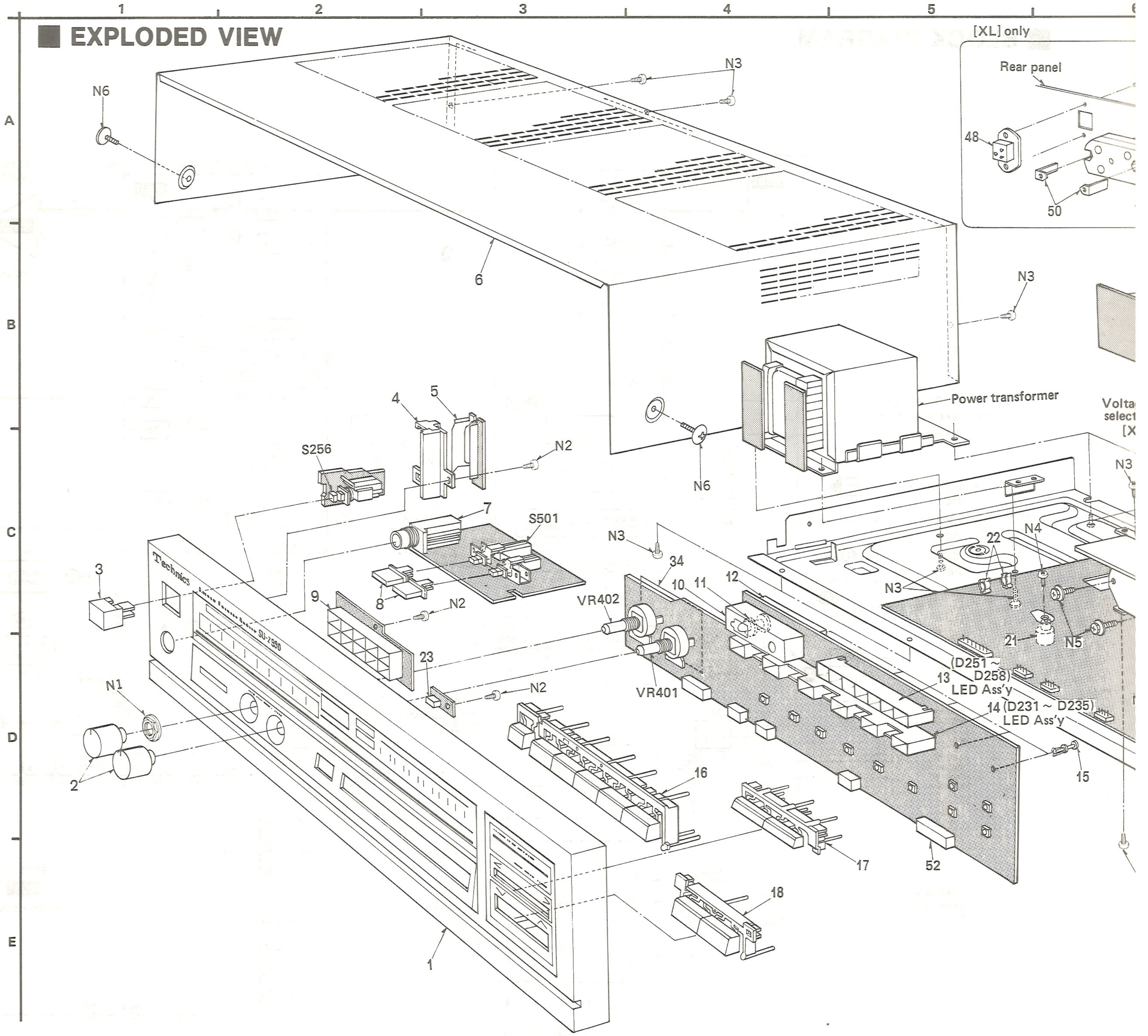
Ref. No.	Part No.	Value
C1	ECKD1H471KB	470P
C2	ECKD1H121KB	120P
C3	ECEA0JK101	100
C101,102[EG]	ECCD1H390K	39P
C103, 104	ECCD1H101K	100P
C105, 106	ECKD1H102KB	0.001
C107, 108	ECEA0JU330	33
C109, 110	ECFTD223KXL	0.022
C111, 112	ECFTD682KXL	0.0068
C113, 114	ECEA1HK010	1
C115, 116	ECEA1CK100	10
C117	ECKD1H103ZF	0.01
C151,152[EG]	ECCD1H180K	18P
C153,154[EG]	ECCD1H151K	150P
C155,156[EG]	ECCD1H101K	100P
C157,158[EG]	ECCD1H101K	100P
C159,160[EG]	ECCD1H101K	100P
C161,162[EG]	ECCD1H101K	100P
C163,164[EG]	ECKD1H103ZF	0.01
C165,166[EG]	ECKD1H103ZF	0.01
C167,168[EG]	ECKD1H223ZF	0.022
C169,170[EG]	ECKD1H223ZF	0.022
C171,172[EG]	ECKD1H221ZF	220P
C173,174[EG]	ECKD1H221ZF	220P

Ref. No.	Part No.	Value
C201	ECEA1CU101	100
C202	ECEA1CK100	10
C203	ECFTD563KXL	0.056
C204	ECEA1EK4R7	4.7
C205	ECEA1CK100	10
C206	ECKD1H222KB	0.0022
C208	ECEA1HU0R1	0.1
C252	ECEA1HK010	1
C253	ECEA1CK100	10
C254	ECCD1H820K	82P
C255	ECCD1H680K	68P
C256	ECEA1HKR22	0.22
C257	ECEA1HK010	1
C260	ECEA1CK220	22
C301, 302	ECEA1HK010	1
C303, 304	ECFTD333KXL	0.033
C305, 306	ECEA1EK3R3	3.3
C311, 312	ECEA1HK010	1
C401, 402	ECEA1EK4R7	4.7

Ref. No.	Part No.	Value
C403, 404	ECKD1H391K	390P
C405, 406	ECKD1H331KB	330P
C407, 408	ECCD1H390K	39P
C409, 410	ECEA1CK100	10
C413, 414	ECFTD123KXL	0.012
C415, 416	ECFTD683KXL	0.068
C417, 418	ECFTD562KXL	0.0056
C419, 420	ECFTD273KXL	0.027
C501, 502	ECEA1HN3R3	3.3
C503, 504	ECKD1H681KB	680P
C505, 506	ECKD1H561KB	560P
C507, 508	ECCD1H040C	4P
C509, 510	ECEA1CU220	22
C511, 512	ECFTD223KXL	0.022
C513	ECEA0JU331	330
C514	ECQV1H224JZ	0.22
C515	ECEA1HU330	33
C518	ECKD1H103ZF	0.01
C523	ECEA2AU100	10

Ref. No.	Part No.	Value
C551	ECEA1CU100	10
C601, 602	ECES1JU682U	6800
C604	ECEA1VU102	1000
C605	ECEA1EU101	100
C606, 607	ECKD1H103ZF	0.01
C608	ECKD1H103ZF	0.01
C609	ECEA1CU471	470
C609, 610	ECQV1H471JZ	470P
C701 ⚠	ECKDKC103PF2	0.01
C702	ECEA1VU331	330
C801	ECEA1CK100	10
C802	ECEA1CK220	22
C803	ECEA1EK4R7	4.7
C804	ECFTD473KXL	0.047
C805	ECKD1H471KB	470P
C806	ECEA1CU470	47
C901, 902	ECKD1H103ZF	0.01
C903, 904	ECEA1CK100	10
C703	ECKD1H223ZF	0.022

EXPLODED VIEW

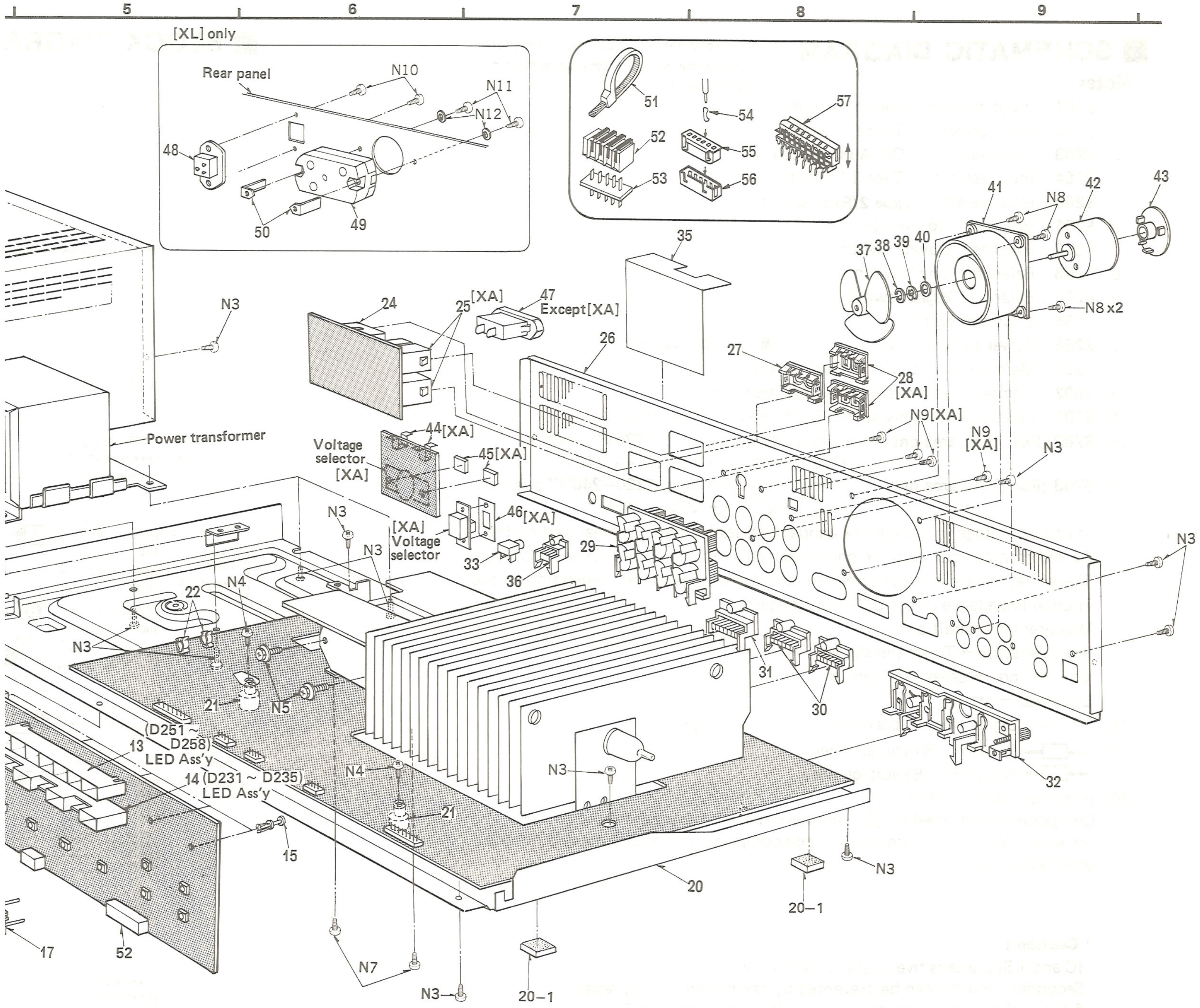


Ref.No.	Part No.	Description
INTEGRATED CIRCUITS		
IC1	MN6013D	Remote Control
IC101[EG]	M5220L	Equalizer
IC101[Other]	M5218L	Equalizer
IC201	LC7818	Input Selector
IC251	LC6523C-3068	Micro Computer
IC252	DN74LS145	BCD Decord
IC301	TC9177P	Attenuator
IC302	M5218P	Buffer
IC401	M5218L	Tone
IC501	SVI3105	Power Amp.
IC801	LA7224	Receiver
IC901,902	SVIBA6144	Meter
TRANSISTORS		
Q1	UN1231	Transistor
Q206 ~ 208	2SK301-QRS	Transistor
Q251,252	2SA1309Q	Transistor

Ref.No.	Part No.	Description
Q253	DTC124ESTP	Transistor
Q254	DTC114YSTP	Transistor
Q255	DTC144ESTP	Transistor
Q256 ~ 259,551, 602,701	2SC3311-Q	Transistor
Q260	DTA114ESTP	Transistor
Q261	DTC114ESTP	Transistor
Q501	2SA992E	Transistor
Q552	2SA1309Q	Transistor
Q601	2SD1265-O	Transistor
Q702[XA]	2SC1685–QNC	Transistor
DIODES		
D1	LN66	L.E.D., Remote Control
D201 ~ 203,205, 206,260 ~ 263, 265 ~ 268, 270, 551, 704, 714	MA165	Diode

Ref.No.	Part No.	Description
D231	LN463YCPP	L.E.D.
D232 ~ 235	LN363GCPP	L.E.D.
D251 ~ 257	LN463YCPP	L.E.D.
D258	LN863RCPP	L.E.D.
D271	MA150LF	Diode
D301,302	MA4068M	Diode
D501,703, 708 ~ 711	MA167	Diode
D601 ~ 604 ⚠	SVDS3V20	Diode
D605,606 ⚠	1SR35200	Diode
D607	MA4051L	Diode
D608	MA4140M	Diode
D552,702	MA4082M	Diode
D705,707	MA4051M	Diode
D706	MA4056M	Diode
D712	LN224WP	LED
D713[XA]	MA4270M	Diode
D801	PN323BLFMS	Diode, photo
D901 ~ 910	LN863RCPP	L.E.D.

Ref.No.	Part
COILS	
L1	ELEA101JA
L201 ~ 206	SLQZ10G1-
L301,302	ELEPH181K
L501,502	SLQY07G-
L601	SLQZ650MH
TRANSFORMERS	
T1[EK,XL] ⚠	SLT5P253
T1[XA] ⚠	SLT5P254-
T1[Other] ⚠	SLT5P252
T701[XA] ⚠	SLT5i25
T701[Other] ⚠	SLT5i24
T801	SLD9B3-Z



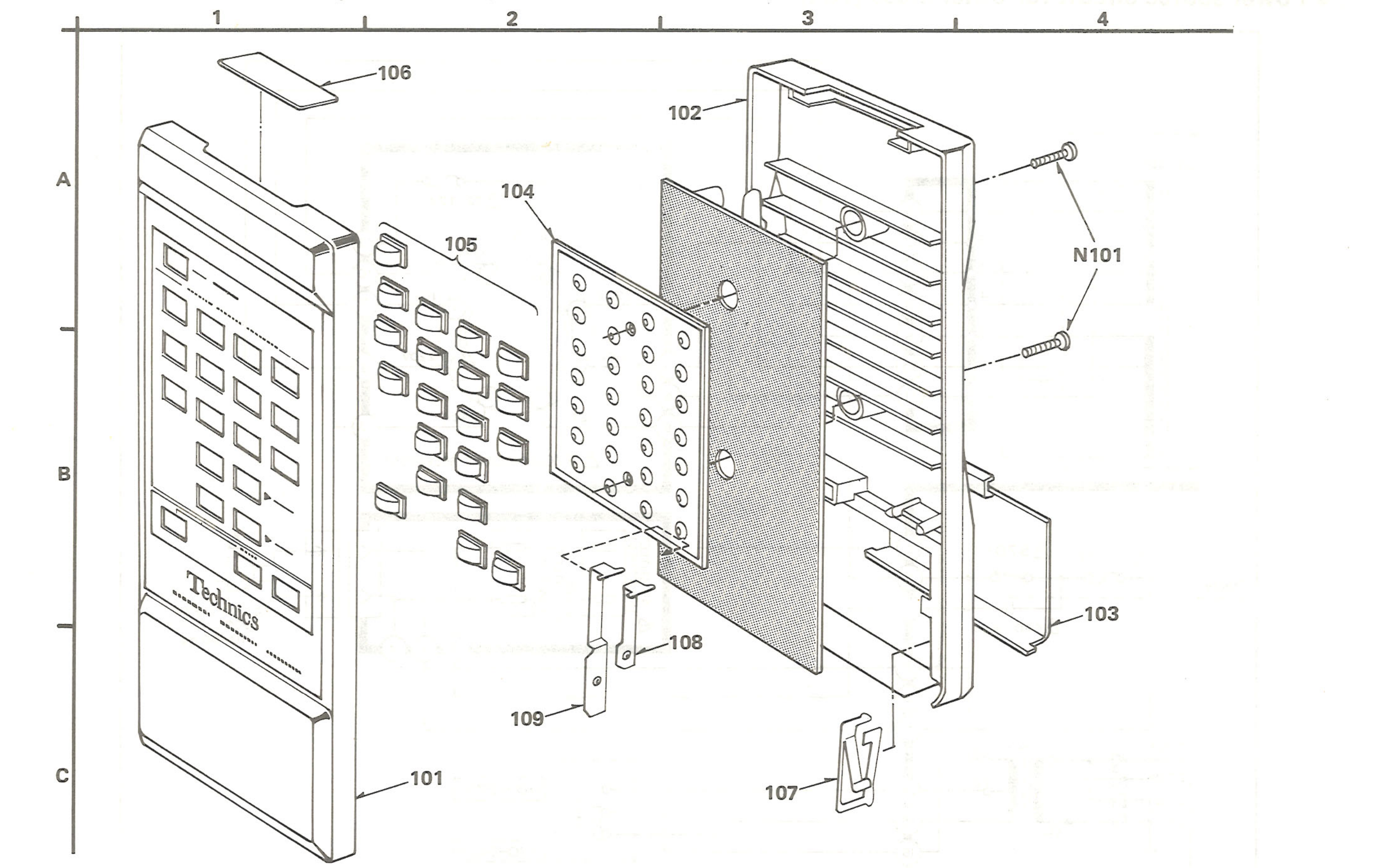
Description
L.E.D.
L.E.D.
L.E.D.
L.E.D.
Diode
Diode
Diode
Diode
Diode
Diode
Diode
Diode
Diode
Diode
LED
Diode
Diode, photo
L.E.D.

Ref.No.		Part No.	Description
COILS			
L1		ELEA101JA	Coil
L201 ~ 206		SLQZ10G1-D	Coil
L301,302		ELEPH181KA	Coil
L501,502		SLQY07G-40	Coil
L601		SLQZ650MH49	Coil
TRANSFORMERS			
T1[EK,XL]	⚠	SLT5P253	Power Transformer
T1[XA]	⚠	SLT5P254-W	Power Transformer
T1[Other]	⚠	SLT5P252	Power Transformer
T701[XA]	⚠	SLT5i25	Stand by Transformer
T701[Other]	⚠	SLT5i24	Stand by Transformer
T801		SLD9B3-Z	Coil

Ref.No.		Part No.	Description
CRYSTALS			
X1		CSB420PB1	420kHz
X251		SVFCSA400MG	4MHz
VARIABLE RESISTORS			
VR401,402		EWC2XA020C15	Bass/Treble
LAMP			
PL601	⚠	XAMS6Q17C	Panel Light
FUSES			
F1[EK]	⚠	XBA2C20TBO	250V, T2A
F1 [XA]	⚠	XBA2C40TRO	250V, T4A
F1[Other]	⚠	XBA2C20TRO	250V, T2A
F2[XA]	⚠	XBA2C20TRO	250V, T2A

Ref.No.		Part No.	Description
SWITCHES			
S201 ~ 205, 251 ~ 255		SSG13	Key
S256	⚠	SSH1159	Power
S501, 502		SSH2113	Speaker
S702 [XA]	⚠	ESE37263	Voltage Selector (Rotary Type)
S703 [XA]	⚠	ESD39108S	Voltage Selector (Side Type)
RELAYS			
RLY501		SSY126	Speaker
RLY701	⚠	SSY123	Power
BATTERY			
BAT1		BR2325-1VC	Lithium Battery

• Remote Control Unit (Transmitter)



Ref.No.		Part No.	Descripton	
CABINET and CHASSIS PARTS				
1		SGYUZ990-KE	Front Panel Ass'y	(1)
2		SBN1032-4	Knob, Tone	(2)
3		SBC666-3	Button, Power	(1)
4		SMP412	Lamp Holder	(1)
5		SMZ320	Reflection Plate, Lamp	(1)
6 [EK]		SKCUZ990-KK	Cabinet Ass'y	(1)
6 [Other]		SKC1950K992	Cabinet	(1)
7		SJJ134B	Headphone Jack	(1)
8		SBC315-7	Button, Speaker	(2)
9		LN108326P	L.E.D. Ass'y	(1)
10		SMC1223	Shield Case	(1)
11		SHR9797	Holder	(1)
12		SMC6406	Shield Plate	(1)
13		LN074328P	L.E.D. Ass'y	(1)
14		LN061330P	L.E.D. Ass'y	(1)
15		SHR415	Nylon Pin	(6)
16		SBC822	Button, Selector	(1)
17		SBC823	Button, Balance	(1)
18		SBC821	Button, Volume	(1)
20		SKUUZ990-KC	Bottom Cover Ass'y	(1)
[20-1		[SKL293	Foot	(4)
21		SHE187-1	Holder, P.C.B.	(2)
22		SJT390	Fuse Holder	(2)
23		LN012280P	LED Ass'y	(1)
24 Except [XL]		SJS9231B	AC Inlet	(1)
25 [XA]		SJS9232B	AC Outlet	(2)
26[E]		SGP6800-1A	Rear Panel	(1)
26[EG]		SGP6800-1B	Rear Panel	(1)
26[XA]		SGP6800-2A	Rear Panel	(1)
26[XL]		SGP6800-3A	Rear Panel	(1)
26[EK]		SGP6800-5A	Rear Panel	(1)
26[Other]		SGPUZ990-KF	Rear Panel	(1)
27		SJS9231A	AC Inlet Cover	(1)
28[XA]		SJS9232A	AC Outlet Cover	(2)
29		SJF4818-1	Speaker Terminal	(1)
30		SJS804	Socket	(2)
31		SJS604	Socket	(1)
32		SJF3062-5N	Input Terminal	(1)
33		SJJ130-1	Jack	(1)
34		SMC1240	Shield Cover	(1)
35		SMX920	Insulation Cover	(1)
36		SJS306	Socket	(1)
37		SHE174	Fan	(1)

Ref.No.		Part No.	Description	
38		SUS271	Ring Spring	(1)
39		XUC2	E Ring	(1)
40		SDX323	Spacer	(1)
41		SMEUS09-KN	Motor Case	(1)
42		MMN6C2RKMS	Motor	(1)
43		SME97-1	Motor Case Cover	(1)
44[XA]		SJT388	Fuse Holder	(2)
45[XA]		SHE209	Spacer, Voltage Selector	(2)
46[XA]		SHE208	Bake Plate, Voltage Selector	(1)
47[EK]	⚠	SJS9227	AC Outlet	(1)
47 Except [EK,XL,XA]	⚠	SJS9225	AC Outlet	(1)
48[XL]	⚠	SJS301	AC Inlet	(1)
49[XL]	⚠	SJS9319	AC Outlet	(1)
50[XL]		SUW2968	Bracket, AC Outlet	(2)
51		SHR301	Clamper	(1)
52		SJS5341	Connector, 3Pin (J2)	(1)
52		SJS5533	Connector, 5Pin (J3,4)	(2)
52		SJS5817	Connector, 8Pin (J1,13)	(2)
53		SJT3311	Post,3Pin (J2)	(1)
53		SJT3505	Post,5Pin (J3,4)	(2)
53		SJT3805	Post,8Pin (J1,13)	(2)
54		SJT783	Connector Pin	(2)
55		SJS5215	Connector	(1)
56		SJT3213	Post	(1)
57		SJT30543-V	Socket	(1)
57		SJT30643-V	Socket	(1)
SCREWS				
N1		SNE4021	Nut	(1)
N2		XTB3+8G	Tapping, ⊕ 3x8	(2)
N3		XTB3+8JFZ1	Tapping, ⊕ 3x8	(19)
N4		XTB3+20B	Tapping, ⊕ 3x20	(2)
N5		SNE2118	Power IC	(2)
N6		SNE2095-5	Cabinet	(2)
N7		XTW3+8T	Tapping, ⊕ 3x8	(2)
N8		XTB3+10JFZ	Tapping, ⊕ 3x10	(4)
N9[XA]		XYN3+C10FZ	Voltage Selector	(4)
N10[XL]		XTB3+10JFZ	AC Inlet	(2)
N11[XL]		XYN3+F16FZ	AC Outlet	(2)
N12[XL]		XWA3BFZ	Washer	(2)

Ref.No.		Part No.	Description	
ACCESSORIES				
A1[EK]	⚠	SFDAC05G02	AC Cord	(1)
A1[XL]	⚠	SJA131	AC Cord	(1)
A1[XA]	⚠	SJA168-1	AC Cord	(1)
A1[Other]	⚠	SFDAC05E03	AC Cord	(1)
A2		SJP2257	Cord, Player Remote Control	(1)
A3[EK]		SJP5219-1	Plug	(1)
A4[XA]		SJP9215	Plug Adaptor	(1)
A5		SWKUZ990KM	Connection Cord	(1)
A6		UM-3NEP-2P	Battery	(2)
A7[EK]		SQF12794	Instruction Book	(1)
A7[EG]		SQF12795	Instruction Book	(1)
A7[XA]		SQF12796	Instruction Book	(1)
A7[Ei]		SQF12797	Instruction Book	(1)
A7[Other]		SQF12793	Instruction Book	(1)
PACKING PARTS				
P1[EK]		SPG5723	Carton Box	(1)
P1[EF]		SPG5724	Carton Box	(1)
P1[Other]		SPG5722	Carton Box	(1)
P2		SPS4751	Pad, Left	(1)
P3		SPS4752	Pad, Right	(1)
P4		SPS4716	Pad, Remote Control	(1)
P5		SPP723	Polyethylene Sheet	(1)

• REMOTE CONTROL UNIT

Ref.No.	Part No.	Description	
CABINET and CHASSIS PARTS			
101	UR64VCS116	Top Case Ass'y	(1)
102	UR64VCS117	Bottom Case Ass'y	(1)
103	UR64EC121	Battery Cover	(1)
104	UR64CT122	Rubber Contact	(1)
105	UR64BT123A	Button	(20)
106	UR64SB125	Tinted Plate	(1)
107	UR52TD101	Battery Terminal, ⊕ , ⊖	(1)
108	UR64TD127	Battery Terminal, ⊕	(1)
109	UR64TD128	Battery Terminal, ⊖	(1)
SCREW			
N101	XTS26+12GFZ	Tapping, ⊕ 2.6 x 12	(2)

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ORDER NO. HAD8706037P3

Parts Change Notice

Model No. SU-Z990 [KE, KEH, KEB, KEF, KEK, KEG, KEi, KXL, KXA]

Please file this parts change notice with your copy of the Service Manual for model No. SU-Z990 , Order No. HAD8605517C8.

Please revise the original parts list in the Service Manual to conform to the change (s) shown below. If new part numbers are shown, be sure to use them when ordering parts.

Reason for Change *The circled item indicates the reason. If no marking, see the Notes in the button column.

1. Improve performance
2. Change of material or dimension
3. To meet approved specification
4. Standardization
⑤ Addition
6. Deletion
7. Correction
8. Other

Notes:

1. Accessory Ref. No. A4, Part No. SWKUZ990KM, in the Parts List of the Service Manual is the connection cable intended for SL-P110 series CD players.
2. The connection cable for SL-P111 series CD players will be shipped together from now on.
3. For details, refer to Ref. No. Hi-Fi-87-021 of the Q.S.M.

Interchangeability Code **The circled item Indicates the interchangeability. If no marking, see the Notes in the bottom column.

	Parts	Unit Production	
A	Original New	Early Late	Original or new parts may be used in either early or late production units. Use original parts until the supply is exhausted, then stock new parts.
B	Original New	Early Late	Original parts may be used in early production units only. New parts may be used in either or late production units. Use original parts where possible, then stock new parts.
C	Original New	Early Late	New parts are to be used in both early and late production units. Stock new parts only.
D	Original New	Early Late	Original parts must be used in early production units. New parts must be used in late production units only. Stock both original and new parts.
Ⓔ	Other		

Part Number Information

Model No.	Ref. No.	Original Part No.	New Part No.	Notes(*,**)	Part Name & Description	Q'ty	
SU-Z990	A5	————	SWKU990E00	5, E	Connection Cord, (For SL-P111 series)	1	

Technics

Matsushita Electric Trading Co., Ltd.
P.O. Box 288, Central Osaka Japan
Printed in Japan
K870600185 YW

ORDER NO. HAD8605536S8

Service Manual

Supplement

Stereo Integrated Amplifier

Amplifier

SU-Z990

Color	Area
(K)	[E] ..... Continental Europe
(K)	[EH] .... Holland
(K)	[EB] .... Belgium
(K)	[EF] .... France
(K)	[EK] .... United Kingdom
(K)	[EG] .... F.R. Germany
(K)	[Ei] ..... Italy
(K)	[XL] .... Australia
(K)	[XA] .... Asia, Latin America, Middle Near East, Africa & Oceania

Color

(K) . . . Black Type

Please use this manual together with the service manual for Model No. SU-Z990, Order No. HAD8605517C8.

MEMORY BACKUP LITHIUM BATTERY USED IN THIS SYSTEM

CAUTION:

This lithium battery is a critical component (Type No. BR2325-IVC. Mfrd by Matsushita Battery Industrial Co., Ltd.). Please observe for the proper polarity and the exact location when replacing it and soldering the replacement lithium battery in.

VARNING:

Detta litiumbatteri (av typ Nr. BR2325-IVC, tillverkad av Matsushita Battery Industrial Co., Ltd.) är en kritisk komponent. Var säker om att iaktta korrekt polaritet och exakt läge av litiumbatteriet under ersättning och lödning av ersättningsbatteriet.

ADVARSEL:

Lithiumbatteriet er en vigtig komponent (type nr Br2325-IVC. Fremstillet af Matsushita Battery Industrial Co., Ltd.). Husk rigtig polaritet og placering ved udskiftning og når De lodder det nye lithiumbatteri fast.

CORRECTION

Kindly correct the notes (page 2) in the service manual of SU-Z990 as follows.

NOTES :

1. The power of the tuner and tape deck in this system are supplied through the amplifier. When servicing these components, prepare an each model or an external power supply (servicing power fixture Part No. : **SZZA1058C**). (For how to use the fixture, refer to the Service Manual of tuner and tape deck.)

   ↑ **Correction**
2. Prepare a transmitter and an amplifier when checking each model of system for its performance using the remote control.

Correction of power supply fixture parts No. :

[E], [EB], [EH], [EF], [EG], [Ei] areas	SZZA1062C
[EK] area	SZZA1063C
[XL] area	SZZA1064C
[XA] area	SZZA1065C

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